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Ninth Annual Report

OF THE

INSPECTOR OF MINES

OF THE

STATE OF MONTANA.

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JOHN BYRNE,	-	-	-	Inspector
FRANK HUNTER,	-	-	-	Deputy

DECEMBER 1, 1897.

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HELENA, MONTANA
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1898

To His Excellency, HON. ROBERT B. SMITH,

Governor of Montana,

Sir:—I have the honor to transmit, pursuant to law my report on the condition of mines and accidents in same, from March 5th, to December 1st, 1897. Also the report of Deputy Inspector, Frank Hunter, as well as the report handed to me by my predecessor, Mr. Chas. S. Shoemaker, from December 1st, 1896, to March 5th, 1897.

Trusting that the same will meet with your approval, I am,

Respectfully your obedient servant,

JOHN BYRNE,

Inspector of Mines.

Helena, December 1st, 1897.

Mine Inspector's Report.

It is gratifying to note the marked improvement in the methods of opening and developing the mines discovered during the past two years. It evidences a greater confidence in the stability, and a better appreciation of the worth of the mineral lodes. Mining has now come to be a business with no greater chance of loss attending it than may be met with in any other legitimate undertaking, and, where directed by men of experience and sound judgment, the risks are even less. This is being recognized as may be seen by the tendency of capital to invest in promising prospects.

The copper-silver mines lead all others in productive capacity. Their stability and permanency have ceased to be a matter of controversy. The true worth of these can only be determined in the years to come.

The gold bearing districts have attracted the attention of a class of men whose connection with any mining enterprise is guarantee of merit. As a consequence, active, systematic development is going on in many sections, several promising discoveries have been made, which will undoubtedly add to the output of the yellow metal.

There are a few silver-lead mines still operating. The many exclusively silver mines and those combined with lead of low grade have closed down. Some of the latter had continued work after it had ceased to be profitable, hoping for a favorable change and endeavoring to prevent the loss and destruction resulting from the mines filling with water, but they were forced to succumb.

The future of coal mining looks exceedingly bright. The consumption is steadily increasing and the many new measures discovered of late would indicate an inexhaustible supply.

The mining industry in general is improving as shown by the large increase in the number of men employed over other years. Its progress is along lines best calculated to inspire confidence in the value and permanency of our mineral veins. A steady, certain advance marks the

progress of this great industry, which will in time place Montana at the head of the list of the precious metal producers.

The mining journals of the state and that part of the press that has taken a stand against the scheming mine promoters, is deserving of great credit. The injury done to the industry and the obstacles placed in the way of securing capital for the development of meritorious enterprises has been truly pictured by the journals referred to.

The mine superintendents and foremen without exception have extended me every assistance in the course of my discharge of duty for which courtesy I hereby make thankful acknowledgment.

ACCIDENTS.

Special attention has been given to investigating the accidents common to mining for the purpose of gaining as thorough a knowledge as possible of their causes to the end that timely suggestions, offered while discharging the duties of my office, may tend to prevent their recurrence.

The greater number of fatalities and injuries inflicted in the coal mines during the first year of my tenure in office are of a character which might have been avoided by the exercise of sound judgment and more caution. By referring to the tabulated list it will be seen that nearly half of the fatal and practically all of the non-fatal accidents were the result of either a fall of coal or top rock. Those from falling coal usually occur while the miner is undercutting the seam. Investigation has shown that had the precaution been taken of placing props against the coal during this process, at least the majority of these accidents would not have been recorded. Where the roof is bad and the lives of those working are in constant jeopardy from falling slate or top-rock, it is the duty of the superintendent to select for such places experienced, cautious miners, possessed of a disposition which makes safety the first consideration and digging coal the second. Were a special rate allowed for working these places, sufficient to equalize the opportunities for earning a fair day's wages with the more favored parts of the mine, all objection on the part of the miner would disappear. By adopting such a rule in places where skill, experience and prudence operate as precautions, the various managers will give some proof of their much asserted desire to avoid accidents.

The metalliferous mines of Montana are reasonably well provided

with safeguards for the protection of life and limb, yet accidents are occurring with such alarming frequency as to occasion serious doubts of their efficacy. This is particularly true of the large producers. The conviction is forced upon me that if human life were given its rightful first consideration in the affairs of these large companies and earnest, intelligent effort made to reduce the fatalities, it could be done by applying the means already at hand. All material and appliances necessary to make safe conditions are supplied. Timbers are furnished without stint. Powder is thawed and distributed by a man employed for that purpose. Ventilation is generally good. Not less than two exits are found in any of these mines. The shafts, guides, safety apparatus and are cages regularly examined and tested. The cage tender has full charge of the cages and bell lines and is the only person authorized to give signals direct to the engineer. The hoisting equipments are marvels in power and mechanism, manned by engineers selected for their skill and experience, and yet, in spite of such seemingly perfect arrangements, the death rate is very high. A glance at the lists hereto appended shows that six lives were lost by caves of rock, six by explosions, two by falling down chutes, six by falling down shafts, and eight by skips and cages. The prevention of those resulting from a fall of rock and explosions is largely dependent upon the caution exercised by the individual. Constant exposure to the risks incident to their calling makes the miner very trustful and accidents from this source can be traced to a failure to employ temporary devices for present safety.

A single trip through one of our large mines impresses one with the utter lack of prudence discovered in many miners in dealing with powder, and the consequence is occasionally brought to our notice in a shocking manner. Of the fatal cases that were caused by skips and cages four were caused by the victim being either struck by or caught between the cages and the shaft timbers, and a careful review of the evidence brought out in the coroners' inquests would warrant the belief that the engineers in charge at the time the other four took place, were not altogether blameless. No doubt exists in my mind regarding the responsibility of the victims in the great majority of cases cited. But have the mine officials done their full duty? I fear not. The causes which operate to make the miner careless have infected some officials as well, but perhaps in a less degree. Men invested with authority have regularly stated, when testifying at inquests, that the victim violated some established rule. Investigation has verified this statement in

many instances. But this also implies a sad lack of discipline, for, upon such testimony, we may reasonably attribute some of these accidents to inability or failure to enforce important rules.

The safe and economical handling of large bodies of men requires the adoption of a set of strict rules and regulations aside from any law now in force. Absolute obedience to such rules should be exacted from the employes and ready compliance can be secured by means of the time check. When any mine officer confesses an inability to enforce wholesome and necessary measures of safety, the thought is suggested that the management has made a mistake in its selection of those who are in immediate control. Unlike most other callings, the security of the miner is largely dependent upon the care and prudence of his fellows, but so wide is the character and disposition of men that in order to obtain unity of action from large numbers, the necessity of subordinating individual plans and methods to a well organized general system must be evident. The duty of the superintendent does not cease when he furnishes means of safety and issues instructions. He should see that the one is properly used and the other implicitly obeyed, and in no instance should he allow the subordinate officials to jeopardize the safety of those in his charge in vain efforts for self reputation.

The fifth session of the Legislature enacted into law two measures of great benefit to the miner, the prime object of both being to provide safeguards against a class of dangers which have claimed a large number of victims in past years. The law providing for an outlet independent of the main working shaft is being very generally complied with. The result is that the miner is relieved from an incessant sense of fear that fire, flood, cave or some kindred disaster might imprison him. Not less important is the mutual benefit accruing to both the owner and miner as a consequence of the greater volume of air that is supplied by this second shaft. The economy to the owner is found in the increasing productive capacity of the miner without adding to the payroll. The miner need waste no time in apprehension of danger and the pure air gives him both strength and will to accomplish more work in a given time. Pure air is as essential to the performance of a good day's work as pure food. Without it the underground worker is incapable of fulfilling the task imposed upon him; in fact, he fails to accomplish enough during his shift to satisfy his own idea of what is right. It, therefore, follows that this law, though mainly in its intent protective, combines protection with the highest principle of economy

to the operator by enabling him to absorb the increased efficiency of the laborer.

Opposition has been manifested to the law requiring the enclosing of safety cages in vertical shafts. The purpose of the law is to protect the miner against the various dangers encountered while being lowered into or hoisted out of the mine. The necessity of it is shown by the number of lives sacrificed while riding in open cages in the past. With few exceptions the law has been complied with. Conditions existing in those exceptions which made it nearly impossible to comply with it within the time specified. A degree of indulgence has been exercised in this matter in the hope of removing certain prejudices existing among a considerable number of employees as well as a few mine owners; also to allow time in which to complete improvements and changes planned previous to the enactment of the law. I am convinced that reasonable leniency is the better policy as against arbitrary enforcement. Sufficient time has now intervened to demonstrate the feasibility and advantage of the measure by pointing to its successful application elsewhere. Now that these conditions which formerly operated against the immediate enforcement of the law have practically disappeared, proper steps have been taken to secure its rigid observance in the near future.

The following exhibits the number of mines inspected, number of men employed and the number of fatal and non-fatal accidents during the last five years.

Year.	Mines Inspected, Number of.	Men Employed, Number of.	Fatal Accidents, Number of.	Non-Fatal Accidents, Number of.	Total Accidents, Number of.	Per cent. of accidents to number of men employed.
1893.....	53	5,312	29	4	33	.62
1894.....	78	7,082	27	19	46	.65
1895.....	88	8,758	41	18	59	.67
1896.....	78	7,727	64	21	85	1.10
1897.....	130	9,825	52	29	81	.82

The number of men employed does not include those working at mills, smelters or other industries dependent upon mining. To the number given for 1897, we may add at least 675 who are scattered prospecting and working claims with from two to four men, thus making a grand total of 10500 men.

FATAL ACCIDENTS.

Name.	Date.	Mine.	County.	Cause.
1 Alvin Offin . .	Dec. 13, 1896	Nettie	Silver Bow	Fall of rock
2 John Ingham...	Jan. 11, 1897	Sand Coulee.....	Cascade	Fall of coal.....
3 R. G. McLain ..	Jan. 29, 1897	Altona.....	Silver Bow	Fell down shaft.....
4 Sigel Van Meter	Apr. 5, 1897	Kennet	Madison.....	Fell down shaft.....
5 Wendell Reiber.	Apr. 21, 1897	Belt	Cascade	Fall of coal.....
6 John Tolonen..	May 18, 1897	Rocky Fork	Carbon	Fall of rock
7 Chas. Fayers...	June 1, 1897	Belt	Cascade	Crushed between mine car and side of entry.....
8 Geo. Chubb.....	June 2, 1897	Drum Lammmon ...	Lewis and Clarke	Premature blast
9 G. Kirschweng.	June 16, 1897	East Rumley	Jefferson	Fell down shaft.....
10 Geo. Pilch.....	Aug. 12, 1897	Mont. Coal & C. Co	Park.....	Crushed b mine car ...
11 Gus. Freeman..	Aug. 23, 1897	Sand Coulee.....	Cascade	Crushed between mine car and side of entry.....
12 John Karki	Sept. 13, 1897	Rocky Fork	Carbon	Fall of top-rock
13 Richd. Murray .	Nov. 2, 1897	Sand Coulee.....	Cascade	Crushed between mine car and roller.....
14 Henry Hohman.	Nov. 24, 1897	Snow Shoe	Flathead..	Exploded missed hole with pick

NON-FATAL ACCIDENTS.

Name.	Date.	Mine.	County.	Cause.
1 Alfred Brown..	Apr. 6, 1897	Mont. Coal & C. Co.	Park	Leg broken by fall of coal..
2 Henry Farro ...	Apr. 21, 1897	Belt	Cascade	" " " "
3 John Milano....	Apr. 21, 1897	"	"	" " " "
4 Edward Rayden	July 5, 1897	"	"	Internal injuries and ribs broken; fall of coal.....
5 John Perrin....	July 9, 1897	Great Northern ...	Jefferson	Sprained ankles by bucket running away.....
6 John Berkin. ..	"	" "	"	Dislocated knee caps, bucket running away.....
7 Andrew Dick...	"	Mont. Coal & C. Co.	Park	Severe injuries by fall of rock
8 Frank Satano...	Aug. 4, 1897	Rocky Fork	Carbon	Fractured ribs by fall of coal.....
9 Joseph Sargeant	Sept. 20, 1897	Mont. Coal & C. Co	Park.....	Broken thigh by fall of coal
10 Jose Santana...	Sept. 24, 1897	" " " "	"	Severe internal injuries, coal fall
11 J. C. Jonas.	Oct. 14, 1897	" " " "	"	Coal fall. Leg and rib broken
12 Albert Dahlberg	Nov. 30, 1897	Twilight Claim....	Deer Lodge.....	Lost eye and other injuries by explosion of caps.....

Record of Fatal Accidents Occurring in Mines from March 5th to December 1st, 1897.

Sigel Van Meter, employed as pumpman at the Kennet Mine, met with almost instant death on April 5th. In the afternoon of the above date he descended to the 230 foot level to inspect the station pump at that place. When stepping from the bucket onto the station, it is supposed he slipped and lost his balance, falling to the bottom, a distance of 120 feet, where he was found by the men working on that level. The Coroner's Jury returned a verdict exonerating the Company from all blame.

On April 21st, Wendell Reiber, a miner employed by the Anaconda Coal Mining Co., at Belt, was instantly killed by a fall of coal in No. 3 room, 7th, So. entry. He, with Sam Coalby, Henry Farro and Nicholas Hanna, were working out a pillar between two rooms. Reiber was engaged, at the time the accident occurred, in shearing or cutting under the coal with the object of tearing down a large quantity of coal with some holes which had been drilled. Coalby and others testified that they warned him and pointed out the danger which he was incurring. Reiber, eager to accomplish a great deal with a little more work, continued, despite the warnings of his fellow workmen, to undermine the coal, until he weakened the overhanging mass, about thirty tons of which fell, killing Reiber and burying him beneath it, and breaking the leg of Henry Farro. The jury brought in a verdict of accidental death.

John Tolonen, a miner working for the Rocky Fork Coal Co., at Red Lodge, Carbon County, met with an accident on the morning of May 16th., which resulted in death two days later. Tolonen, his son, Isaac Orni and John Hill, were working in parallel rooms which were being pushed to the surface for air courses. These rooms are connected by cross cuts. About 4 A. M., Tolonen, preparatory to blasting, moved his drills and tools into the cross cut nearest the face of the rooms, and while there was struck by a slab of rock which fell from the roof within the cross cuts. This cross cut was driven by the unfortunate man who met his death there and the three others mentioned, only a few days before. It was not more than ten feet in width and, upon the statements of the three others, the roof appeared to be firm and strong, and was considered by all of them to be absolutely safe.

Chas. F. Ayers, a driver for the Anaconda Coal Mining Co., at Belt, Cascade County, sustained injuries on June 1st, at about 11:30 A. M. from which he died a few hours later. The cause of the accident can only be surmised, as the unfortunate man was alone when it occurred. He was taking a trip of cars with a mule through the cross entry between the first and second south main entry of No. Two mine, and, when discovered, which was some time after the occurrence, he was jammed between the car and the side of the entry. The various ways in which an accident like the above might be brought about, make it idle to indulge in any theories as to the manner in which it occurred.

Geo. Chubb, a miner working in the Drum Lummon Mine, at Marysville, Lewis and Clarke County, met with a horrible death on the 2nd day of June, 1897. Chubb, with a fellow workman named William Callaway, was engaged in sinking a winze on the 1000 foot level, and was down about 16 feet below the bottom of the drift. They had drilled a round of eight holes with a power drill and made all necessary preparations to blast. At 5:30 P. M., Chubb went and notified some other men working in a stope 100 feet away that they were going to blast. Returning he told his partner, Callaway, in the bottom of the winze, to fire away, and stationed himself at the top of the ladder prepared to pull it out and away from the shots. Callaway ignited the fuse and climbed out. Chubb immediately proceeded to pull the ladder out and had it about half way up when a shot exploded, striking him with some flying rock and knocking him into the winze, besides striking Callaway a severe blow on the arm, throwing him back in the drift and extinguishing the lights of those working near there. After striking the bottom, Chubb loudly and frantically called for assistance to help him out. His cries were heard by T. H. Jewell, a miner working in a stope 100 feet away, who, after relighting his candle, rushed to the winze, and in obedience to the agonizing appeals of the frenzied man below, hurriedly looked for a rope, and not finding any at the end he was at, told Chubb so and was about to cross the winze in search of a rope at the other end, when the unfortunate man imploringly asked him to make haste as there were seven more holes ready to explode. This warning, Jewell states, excited his fears, and instead of crossing the winze he retreated and started to reach the place by a circuitous course through the drifts, but had not got more than 50 feet away from the winze when the other shots began exploding. In this mine the

men are not allowed to handle powder, caps or fuse, except when blasting, everything being prepared for them by a man employed for that purpose. In sinking shafts and winzes the management supplies the men with a fuse eight feet in length for each shot, which was the length used in this case. I am strongly inclined to the belief that the fuse attached to the shot they desired to explode first was cut considerably shorter by one of the men. I am led to this belief by the difference in the time elapsing between the exploding of the first and the remainder of the shots. The Coroner's Jury rendered a verdict of accidental death.

George Kirschweng, engineer at the East Rumley Mine, Jefferson County, came to his death as a consequence of falling from the ladder while ascending to the surface, on the 16th day of June, 1897. The victim descended the ladder to the 150 foot station to see how the work in the mine was progressing. After talking for a while with the miners, he started to return to the surface and was last seen alive by Orin Merriman, who watched him start to climb the ladder. A few minutes later Merriman returned to the shaft from the stope for the purpose of signalling the engineer, and was horrified to find Kirschweng's lifeless body at his feet. There were no eye witnesses to the accident and it is not known how far Kirschweng fell nor how he lost his hold on the ladder.

On August 23rd, Gus. Freeman, a driver in the employ of the Sand Coulee Coal Co., at Sand Coulee, met almost instant death by being caught between one of the loaded cars he was hauling and some empties which were standing on a side track at a parting in the 12th. South entry. He had charge of a team of mules that hauled from the inside workings to the place where the accident occurred, and was pulling a load of eight cars and sitting on the front end of the first car and on the side next the entry. The track in front was filled with loaded cars and the parallel track with empties, with a space of five feet between the two tracks at the parting. When the mules approached within a few feet of the loaded cars they turned out and around as usual, while Freeman attempted to unhitch the tail chain; but when connecting it with the load, instead of fastening it in the place provided for the purpose on the cars, he hooked it on the bar that is placed across the end of each car to hold the door in place. The team, in pulling, tightened the hook between this bar and the door and consequently his effort to release the chain failed. The animals, accustomed to instant release,

kept going, catching Freeman across the body with the tail chain and pulling the loaded car off the track, pinning the unlucky man between it and the empties on the other track. The Coroner's Jury rendered a verdict of unavoidable accident.

George Filch, an employee of the Montana Coal and Coke Co., at Aldridge, Park County, sustained injuries on August 12th, which resulted in death on August 19th. Pilch and Swan Peterson were working in room No. 7, left upper plane. The vein at this point has a fifteen per cent. pitch, necessitating the use of windlass and rope to haul the cars into the rooms and lower them to the entry when loaded. They were in the act of lowering a full car to the entry, when the accident occurred. Peterson stood by the windlass letting the car down while Pilch went in front of the car to prevent its leaving the track. When about seventy five feet from the face, the rope broke. The unfortunate man, unable to hold it back, was knocked down, the load, weighing some 1200lbs., passing onto his body, causing such serious spinal injuries that death resulted seven days later. An examination showed the rope to be very defective, and were it not that the management compelled the men to furnish the rope and windlass, I would hold the Company responsible for the accident.

John Karki, a native of Finland, met with instant death by a fall of top rock, in room 119, 2nd level of slope, of the Rocky Fork Coal mine at Red Lodge, on September 13th. He, with John Warila, had taken down some loose top rock in the forenoon of the above date, and made an effort to bar down the rock that afterwards caused his death. Finding that it resisted the power which he was able to exert on it with a bar, he concluded that it was sufficiently safe to work under. The work which he done removed the support the rock was receiving from the solid coal, causing the fall, and killing him instantly. The roof in this part of the mine is very treacherous and calls for careful attention from those in charge and from the miners. Very little fear is apprehended of a large fall of rock. The danger comes from small slabs of slate, like sandstone, becoming detached from the roof. As the coal is worked from underneath, props are put in as close to the face of the room as working will permit. The Coroner's Jury rendered a verdict of accidental death.

Richard Murray met with almost instant death on the evening of November 2nd, at the inner end of the main travelled south parting of intersection of 5th, Butte entry, at Sand Coulee coal mines. The un-

fortunate lad was but seventeen years of age and his occupation at the time of his death was that of trip rider on one of the auxiliary haulage roads which haul the cars from the inner workings to a parting or place where a trip is made up for the main haulage rope. It was his duty to ride the front end of the first car when a loaded trip was being pulled out, for the purpose of pulling a pin from a clevis which connected the rope with the drawbar of the car. After disconnecting the rope he would instantly jump from his place, the cars passing on and down the track, which was inclined from there in the direction they were going to the parting. The engine is set on top of the timbers and over a switch from which tracks leading to the surrounding workings are run, and, at a point where the tracks on the main roadway inclined downward from it. The rope leading from the engine had, of necessity, to be run overhead on rollers for the distance the switch extended, from whence it trailed along the centre of the track. At a point near the roller referred to, a man is stationed whose duty it is to ring the stop signal when the first car of the trip reaches the top of the grade, which is some twenty five feet from the rollers. The accident occurred at 6:25, P. M. On the first trip of the shift, Murray descended the slope, connected a trip of seven cars and gave the hoisting signal. When the first car reached the place where the stop signal should have been given, Murray endeavored to pull the connecting pin, but without succeeding, and, unfortunately for himself, continued his efforts to disconnect the rope until he and the car were pulled against the rollers and roof, Murray receiving injuries which ended in death a few minutes later. The was conflicting as to the ringing of the stop bell, the engineer testifying that he failed to receive the signal while the bellman testified that he pulled the bellrope as usual, but did not hear the bell ring. Both sides were supported by other witnesses. The Coroner's Jury returned a verdict charging the victim with carelessness and the other employees on duty at that place with negligence. After carefully examining the place and the circumstances attending the accident, I fail to discover the grounds upon which the jury blamed the victim. He did not know that the stop signal had not been given and he could not pull the pin unless it was given and responded to by the engineer closing the throttle valve on the engine and applying the brake, thus relieving the tension on the rope, at the same time allowing the pin to be removed with a slight pull. Notwithstanding that the other employees failed to do these things and the services required of the victim

could only be performed through the others doing their duty, and the further fact that Murray had but twenty-five feet from the top of the grade to the roller with the cars traveling some eight miles an hour to perform the services mentioned leads me to the conclusion that the verdict is contrary to the facts in so far as related to the victim, and is not justified by the evidence.

Henry Hohman, a miner employed at the Snowshoe Mine, met with a sudden death on the night of November 24th. It appears that a hole had failed to explode in the place he worked, and while picking in the face he stuck his pick into the missed charge, causing an explosion which resulted in instant death. The above facts were learned indirectly, as the mine officials failed to notify this office. I have addressed a communication to the proper parties relative to this matter.

Record of Non-Fatal Accidents Occurring in Mines from March 5th, to December 1st, 1897.

Alfred Brown, a native of Scotland, was injured at Horr on April 6th, 1897. Brown and another man were working in Clark's entry, and were engaged in taking down the roof and side of the entry. The rock was perfectly solid and required the drilling of a hole, after firing which, Brown returned to pick down the loose rock caused by the blast. While doing so a portion of the loose rock fell, striking Brown, causing a fracture of the large bone of the leg between the knees and ankle and severe contusion of back and hips.

Henry Farro, a miner employed by the Anaconda Coal Mining Co., at Belt, while working in room No. 3, 7th South entry, Belt Coal Mine, received a badly broken leg, by a fall of coal, on the morning of April 21st. Farro, at the time, was shovelling coal back from the breast, and was working immediately behind Wendell Reiber, who was undercutting the coal. Farro was aware that the place was not safe, having warned Reiber to that effect. Nevertheless he remained in a place that he advised another to come away from. Investigation shows that Farro's escape from instant death was almost miraculous, his fellow workmen having to dig from three to four tons of coal, under which he was buried, to get him out.

John Milano, an employee of the Anaconda Coal Co., was injured in the mine at Belt, in room 17, 4th, South back entry, on April 22nd, 1897. Milano was engaged at working down a large block of coal weighing about one and one half tons, which was loose and was using a long track rail as a lever to pry it down with. When the coal started to fall, Milano attempted to step back out of danger, but, unfortunately, stumbled and fell. The great mass, after striking the floor, rolled over and onto Milano's leg, causing a serious break and inflicting other slight injuries. A thorough examination of the place showed it to be in a safe condition.

Edward Rayden, a native of England, on July 5th., while working in No. 2 mine of the Anaconda Coal Co., at Belt, in the 2nd South entry, sustained very severe injuries from a fall of coal. Rayden and his partner, Richard Bates, were engaged in drawing a pillar of coal and had given it the usual test, i. e., sounding the breast with a pick to discover if any of it was loose. Supposing it sufficiently safe, Rayden com-

menced mining underneath and Bates proceeded to put in a hole. They had not worked very long when Bates noticed the coal moving and called to Rayden, warning him of the danger. The warning came too late as the mass of coal fell at the same instant, crushing Rayden underneath it, breaking several ribs and inflicting severe internal injuries.

John Berkin of Boulder and John Perrin of Butte had a close encounter with death on the 9th day of July, while descending the shaft of the Great Northern mine situated about five miles north of Boulder, in Jefferson County. Both gentlemen are interested in the property, Mr. Perrin assisting in the management while Mr. Berkin was paying a visit of inspection. The shaft is 175 feet in depth, slightly inclined. After taking their places on the bucket and signalling the engineer to lower to the bottom, everything went well for about 100 feet, when, suddenly, the bucket started on its downward course at a terrific speed, carrying both men to what seemed certain death below. There was a car standing on the platform in the shaft. This the bucket landed on throwing Mr. Perrin and Mr. Berkin violently onto the station, spraining Mr. Perrin's ankles badly and causing quite a shock to his system, and dislocating one of Mr. Berkin's knee-caps and inflicting other minor injuries. Upon examination I found that the fault did not lie with the hoisting machinery, as it was in very good condition. The engineer had been there but two days, and as the brake was operated by a wheel which worked a screw capable of exerting a powerful leverage, it could not be charged to that. The screw that works the brake, however, operates the reverse way; that is, it is a left handed screw, and the engineer, in a moment of forgetfulness, and having had but little experience with this particular kind of gearing, might have attempted to tighten the brake by turning the screw in the ordinary way (*viz.* right handed,) while he would be, in fact, loosening it. This is the only reasonable manner, in my opinion, of accounting for this accident.

Frank Satona was seriously injured at the mines of the Rocky Fork Coal Co., at Red Lodge, on August 4th, by a fall of coal. The unfortunate man was engaged in mining beneath a large overhanging piece of coal that he considered safe, when, without warning, a piece weighing several hundred pounds fell on him, fracturing two of his ribs and causing severe internal injuries.

At Horr Coal Mine, on September 20th, Joseph Sargeant was caught by a fall of coal while undercutting the seam, which resulted in a broken thigh and some minor injuries.

Jose Santana, in the same mine, on September 24th, received severe injuries in the back, rupturing several muscles, with slight internal injuries. The accident was caused by a fall of coal as in the other case.

J. C. Jones, at Horr, October 14th, while working in the face of entry, was caught by a fall of coal and rock and received injuries consisting of a broken leg, cuts on head and broken rib. This accident I did not personally investigate, being absent at the time the notification was sent.

On Novemebr 30th, Albert Dahling, a minor engaged in doing assessment work on the Twilight claim, near Bald Butte, received injuries of a very serious nature, resulting from an explosion of blasting caps, caused by a spark from the candle in the unfortunate man's hand, or a drop of hot grease from the same, while removing the cover from the box.

... MINES ...

MEAGHER COUNTY.

Great Eastern Mine, located 2 1-2 miles from Castle; owned by the Great Eastern Mining Co., operated by William Shakespeare, under lease, and is managed by that gentleman; Chris. Trewarden, Foreman, employs 25 miners and 9 topmen. The main shaft is sunk on the vein and is 115 feet deep. Hoisting is done with a whim, 5-8 inch steel rope and bucket. Ventilation is very good. Half sets and stulls are employed in timbering. Character of ore, carbonate, the values being silver and lead. There are two openings to the mine, though one of them could be utilized only for ventilating purposes, as it is not timbered nor is it provided with a ladderway of any kind. When the attention of the manager was directed to the danger to which the miners were subjected and the personal responsibility attaching to himself, he readily agreed to the recommendation that it be put in condition to serve as an escape shaft as rapidly as the work would allow. The ore from this mine is treated at the East Helena smelter.

Yellowstone Mine, situated about three miles from Castle, owned and operated by the Yellowstone Mining Co., F. C. Holman, Superintendent and Manager. Employs 10 miners and 3 topmen. Hoisting is done through a two compartment shaft, 400 feet deep, by means of a 20 H. P. Kendall engine, 5-8 inch steel rope and safety cage. The ore is carbonate. Square sets and stulls is the system of timbering employed. There are two openings from the two hundred to the surface. From there down but one. I received assurance that, should the lower level be worked, an upraise would be put through without delay. Ventilation from the two hundred upwards is very good.

Judge Mine, situated at Black Hawk, about eight miles north of Castle. Owned and operated by the Judge Mining Co., James King, superintendent and manager, employs eight men underground and two on the surface. The shaft is sunk on incline and is two hundred and thirty feet deep, and two compartment stulls are used in timbering. Character of ore is carbonate, carrying silver and lead. Hoisting is done with a 40 H. P. Ledgerwood engine, 3-4 inch steel rope and bucket. This mine has been closed down for some time, resuming op-

eration recently. There is but one opening at present. The manager promised to proceed and put in a second outlet without delay. Ventilation is furnished largely by means of pipes conducted down the shaft and into the workings. The supply, while sufficient for the present force, will not furnish the volume needed if the mine is to be worked to its full capacity. The other opening, when put in, will remedy this also. The ore is shipped to East Helena for reduction.

RAVALLI COUNTY.

White Cloud Mine, located eight miles from Florence, is owned by Jameson, Bowden & Co., and operated by Clark and Wheeler, John McCooey Superintendent and Foreman. Eight men are employed in the mine and four on the surface. The shaft is down 140 feet while a tunnel, driven through the hillside, connects with the shaft above midway of its depth. The present operators are putting the mine in fairly good condition under Mr. McCooey's direction. The mine had previously been operated by parties who had little consideration for the safety and welfare of the miners, and none whatever for the mine. A temporary upraise through the old workings has been made and the conditions generally much improved. Hoisting is done with a 30 H. P. Ledgerwood engine, 3-4 inch steel rope and bucket. The method of timbering is with tunnel and square sets. Ventilation is fair. The means of exit are not as secure nor do they provide as ready a means of egress as the law contemplates. This is not the fault of the present operators, as they exhibit a disposition to do every thing within reason assuring me that due diligence will be used in the making of a permanent and safe upraise. The ore is pyritic iron and gold in combination. The mine is also equipped with a 75 ton concentrator.

Curlew Mine, located about three miles from Victor is operated under the management of H. P. Kennett, who is also Receiver of the Property. J. A. McDonald, Foreman. The shaft is two compartment, 200 feet deep and well timbered. Hoisting is done with a 25 H. P. engine, 3-4 inch steel rope and car and crosshead. Ten miners are employed and four topmen. Tunnel sets and stulls is the method of timbering adopted. Silver and lead are the principal metals of value contained in the ore. With the main shaft as the only opening and natural means only resorted to for ventilation the air must necessarily be insufficient in volume and poor in quality. As to a means of escape in case of fire de-

stroying the hoist building, none existed. An upraise however, had been started from the 200 foot level to the surface, and I was assured that work on it would be diligently prosecuted until completed.

DEER LODGE COUNTY.

Ontario Mine, owned by the Ontario Mining Co., managed by G. N. Southmayd. B. S. Brownson, Foreman. Operations are conducted through a tunnel 625 feet in the hill from which is sunk a two compartment shaft 300 feet in depth. Tunnel sets in the drifts are all the timbering necessary as enough waste matter is found in the mine to fill the stopes. The hoisting plant consists of a 60 H. P. engine, 3-4 inch steel rope and cage. There are three exits and ventilation is excellent. A first class concentrator of 200 tons capacity is set close to the entrance to the tunnel. Five men find employment around the mine at present. Owing to complication which involves the mine, little has been done for some time. With the present difficulties removed and under efficient management, a large force could be employed and handsome returns made to the owners.

Bald Butte Mine, owned and operated by the Bald Butte Mining Co., situated about four miles west of Marysville. B. H. Tatem, Manager; Wm. Shovel, Superintendent and Foreman. Employs 45 men underground and 3 on surface. Operations are carried on through two tunnels, No. 1 being in 1500 feet from the entrance, and No. 2 bores the mountain for 1700 feet. Timbering is done with half sets and stulls. Ventilation is excellent, there being several connections between the two tunnels. The ore is free gold and is hauled through the tunnels with mules and dumped in a large bin from whence it is carried to the company's 40 stamp mill, about a mile distant from the mine. There is also a neat electric plant in connection with the mill and mine which furnishes the power for operating the stamps and vanners besides lighting the mill and tunnels.

Copper Mine, located about ten miles north of Lincoln; owned and operated by Fred Dickert; Fred Dickert, Jr., Superintendent and Foreman. Employs ten miners and five topmen. Operated through two tunnels, the main working tunnel being 2000 feet in length. Timbered with tunnels sets. The character of the ore is copper. Ventilation is good.

Prize Mine, owned and operated by the Prize Mining Co. Owen

Byrnes, Manager and Superintendent, employs 11 miners and 3 topmen. The main shaft is 500 feet in depth, 100 feet of which was sunk the present year. Timbering is done with stulls, while the hoisting plant consists of a 40 H. P. Fairbanks friction engine, 7-8 inch steel wire rope, and skip. There are three exits and ventilation is very good. The ore is free gold and is treated in a 10 stamp mill belonging to the Company.

Among the number of properties working a small force in this district, the Empire and Bell Boy mines owned by Sam Word and Sons, deserves mention. The development done the past season has been mostly devoted to proving these veins near the surface. The results have been such that with a force of but five miners they have kept twenty stamps dropping the greater part of the time. The mines are in charge of John H. Moffit, a miner whose knowledge and experience in mining eminently qualifies him for the position.

JEFFERSON COUNTY.

Grey Eagle Mine, located about eight miles from Boulder, owned and managed by Holmes and Dahlman. This is one of the paying discoveries of the present year. The mine is operated through two tunnels. No. 1 is in a distance of 230 feet and No. 2, 300 feet, connected by an upraise of 100 feet. The mine is timbered with sets and stulls. Ventilation is fair and the connection between the tunnels furnishes a means of escape in case of danger. Six men secure employment in the mine and two on top. The character of the ore is silver and lead and it is treated at the East Helena smelter.

Columbia Mine, located about 2 1-2 miles from Pipestone Springs, is owned and operated by C. W. Hoffman & Co. E. R. Purnell Superintendent and Manager. Chas. Taylor Foreman. Employs six miners and four topmen. Two shafts are sunk on the vein. The main working shaft is 250 feet deep, the ventilating and escape shaft being 195 feet deep with drifts connecting them at the 100 and 190 foot levels. The hoist consists of a 30 H. P. Ledgerwood engine, 5-8 inch steel rope, with bucket and crosshead. Ventilation and safety precautions are all that can be desired. Character of ore is gold, base.

Ruby Mine, situated about eight miles south-west of Bernice, owned by Chas. H. Nickel and others, and operated by the Gold Mountain Mining Co. M. L. Hewitt, Manager and Martin Buckley, Superintendent

and Foreman. Employs 22 miners underground and 12 men on top. Operations are conducted through a two compartment shaft, 200 feet in depth, and a tunnel 700 feet in length which connects with the shaft 150 feet from the surface. The mine is timbered with tunnel sets and stulls. There are two exits providing the necessary means of escape in case of danger from any cause. Ventilation is very good. The hoisting plant consists of a 25 H. P., Ledgerwood engine, 3-4 inch steel rope, with bucket and crosshead. The quartz is gold and silver bearing. Some parts of the vein carry very high values and the greater part of it between the walls is, a profitable milling ore. The company has erected a combination gold and silver mill on this property comprising ten stamps with plates, and five concentrating vanners. Besides keeping the mill constantly going, a large amount of high grade ore is shipped to Butte for treatment. Mr. Hewett started out to make the Ruby one of the big producers of Montana, and, as development proceeds, the mine gives every promise of realizing his expectations and justifying the high opinion entertained by him of this property.

King Solomon Mine, situated on Clancy Creek, owned by E. Redding, operated under lease by Jos. Latsch and others. A two compartment shaft, 125 feet deep is sunk on the vein. A whim, 5-8 inch steel rope and bucket complete the hoist. Eight miners are employed. Galena, carrying lead and silver, are the precious metal contained in the ore. Timbering is done with sets and stulls. The main shaft is the only opening on the mine and having no buildings over the shaft exempted them from the provisions of the law. However, I was assured that if the development then under way warranted it, an upraise would be made.

Bonanza Chief Mine, located at Montana City, owned, operated and managed by Geo. T. Wickes, Peter Mack, Foreman, employs fifteen miners and four topmen. A two compartment shaft, 175 feet deep, 15 H. P. engine, 5-8 inch steel rope and bucket with crosshead, comprise the hoisting equipment. Timbering is done with square and tunnel sets. The principal value contained in the ore is gold. Ventilation and means of escape are met by an independent opening. This opening is a considerable distance from the workings and rather too near the main shaft to properly ventilate the mine.

Mammoth Mine, situated at Clancy, owned by Merrill and Miller, operated under lease by G. A. Bailey. Work is carried on through a tunnel, 400 feet long, which is connected with the surface through the

stopes. Twelve men find employment in the mine, most of them working on sub-leases granted by Mr. Bailey. The ore is silver and lead galena. The condition of the mine is very good.

Great Northern Mine, situated five miles from Boulder, operated the greater part of the present year by Neil J. McLoud, under lease, employs five miners and two engineers. The main shaft is a two compartment one, 175 feet deep. Hoisting is done with a 30 H. P. Webster, Camp and Lane engine, 3-4 inch steel rope and bucket. Tunnel sets are used in timbering the drifts. The ore is sulphide, carrying gold, silver, lead and copper. There is no other opening aside from the main shaft and development had not reached that point where a compliance with the law could be exacted. Ventilation is fair.

Minah Mine, located near Wickes, operated a part of the present year under lease, employed twenty-five miners and ten top men. Operations are carried on through two tunnels, the main working tunnel being 3000 feet in length. There are two outlets and ventilation is very good. Timbering is done with tunnel sets and stulls. The ore is pyrites, carrying gold and silver and is treated on the ground in a 30 ton leaching mill run in connection with the mine. The conditions in and around the mine are all the law requires. The works have been closed down for some months, owing to litigation between the parties interested. I am, however, informed that a decision has been rendered in the case. That being so, we may expect to see this mine resume its place among the list of producers.

The Elkhorn Mine, under the management of W. S. Kelly, assisted by Wm. Davey as Foreman, is maintaining its reputation as one of the most reliable producers in the state. One hundred miners are employed. The shaft is sunk on incline and is 2,300 feet in depth, the deepest opening in the State. Ventilation is very good as far down as the 1800 foot level. A means of escape is also provided by an opening independent of the main shaft from the 1800 foot level to the surface. An upraise has been started from the lower level to connect with the 1800 foot level, which, when completed, will fulfill all the requirements of the law. The ore is silver and lead and is reduced in the 25 stamp mill run in connection with the mine. All reasonable precautions are exercised in the interests of the miners.

Several reliable producers have recently suspended operations as a consequence of the continued decline in the price of silver, and while it is true that these same mines were operated for a period when prices

were but little better than at the time they shut down, it must be remembered that costly development, such as sinking, drifting, putting in upraises, etc., was done at a time when prices were much better. The closing of these mines is but temporary, as their wealth of minerals has been barely exposed, and only a favorable change in present conditions is needed to again align them in the ranks of the producers. Among those which have suspended are the Little Nell, located at Lump City, which employed 30 miners and twelve men engaged at other work, owned by Dr. Head & Co.; the Old Comet Mine, situated at Comet, worked under lease, by N. Stewart and others, employing 30 miners and 10 topmen; the East Rumley, located at Comet, operated, under lease, by Dowling & Johnson, employed 8 miners and 2 engineers; the Eva May, located on Cataract Creek, about seven miles from Basin, owned by the Montana Mineral Land Development Co., employed 40 miners and 12 men on surface. It is expected that this mine will resume operations shortly.

Overland Mine, located near Montana City, owned and operated by F. Esler & Co. Five men are employed underground and two on surface. The main shaft is sunk on an incline and is 300 feet deep. Hoisting is done with a whim, 1-2 inch rope and bucket. The values contained are mostly gold. Failing to find the manager at the time of my visit, I addressed a communication to him relative to the general condition of the mine, which was not what it should have been.

Note—I have since learned that considerable improvements have been made both in machinery and in the mine.

MADISON COUNTY.

Galena Mine, located about 2 1-2 miles south-west of Pony; owned and operated by the Garnet Gold Mining Co., C. H. Wood, Superintendent and Manager. J. R. Barclay, Foreman. Fourteen miners find employment in the mine and five at the top. Work is carried on through two tunnels of a length of 850 and 750 feet respectively. Timbering is done with square and tunnel sets. Ventilation is very good. The tunnels although connected by an upraise, did not serve as a means of escape, as stoping was being done around the upraise and no attention given to maintaining a ladderway from the stope to the upraise, a distance of some twenty feet, thereby making the connection practically useless as a means of egress. I recommended that this be attended to immediately as the possibility of fire was very great owing to

the buildings, blacksmith shop etc., being placed over and covering the entrance to the tunnel. I received positive assurance that the defect would be attended to at once. The ore contains gold, lead and copper, and is treated in the twenty stamp mill owned by the company.

Carolina Mine, located about nine miles east of Twin Bridges, owned and operated by Hoffman and Chisholm; C. H. Hoffman Manager, E. R. Purnell, Superintendent, Thos. Smith, Foreman, employs six miners and two topmen. Two tunnels have been driven. No. 1 is 250 feet and No. 2, 365 feet. Tunnel sets and stulls is the system of timbering followed. The tunnels are connected, providing an abundant supply of pure air as well as an outlet in case of emergency. The ore contains pure gold principally, with a small percentage of lead, and is shipped to East Helena for treatment.

Little Kid Mine, located about seventeen miles from Norris, owned and operated by F. W. Noonberg who also manages the property assisted by J. E. Moberg as Superintendent. Five men are employed underground and ten on surface. The mine is developed through four tunnels, the main one of which is 400 feet. Connections are made between the tunnels, supplying a sufficient volume of air for all purposes, besides several outlets. Tunnel sets and stulls are used in timbering. Character of ore is gold, which is treated in a twenty ton Bryan mill erected near the mine.

The Leiter Mine, located on Wisconsin Creek, eight miles east of Sheridan; L. Z. and T. Benton Leiter, owners; E. H. Trerise, Manager and Superintendent; Thos. Lewis, Foreman. Forty-five miners are employed and ten topmen. The mine is worked through a tunnel 900 feet in length from which a two compartment shaft 400 feet in depth from the level of the tunnel, is sunk and equipped with a 50 H. P. Ottumwa engine, 7-8 inch steel rope and single deck cage, with safety apparatus, which are tested regularly. Gray's patent chairs are in use and give thorough satisfaction. The cage is also provided with doors of very simple construction which do not in the least interfere with the handling of the car or timbers, and furnishes the protection contemplated by the law. Tunnel sets and stulls are used in timbering, though for the amount of development, but little timber is used or needed, as the walls are very hard. There are two exits and ventilator. Everything considered is good. A gravity tramway, 2700 feet in length transports the ore from the mine to the twenty stamp mill, owned by the same parties.

Monitor Mine, situated at Richmond Flat, seven miles south of Norris, owned and operated by the Monitor Mining Co., S. K. Knox, Superintendent and Manager, A. McKinnon, Foreman. Thirty-three men are employed underground and two on top. Work is carried on through a two compartment shaft, 160 feet deep. A whim, requiring three horses to operate, with a 5-8 inch steel rope, bucket and cross-head, is the means employed in hoisting the ore to the surface. The management aims to hoist as little waste as possible, using it to fill the stopes as worked, thus saving the cost of timbers and keeping the mine secure. Timbering is done with stulls and half sets. The quartz contains gold in base form and is treated at East Helena, and Omaha smelters. The comfort and safety of the men receive special attention as evidenced by the care given to ventilation and means of egress, which are very satisfactory.

Clipper Mine, located three miles west of Pony, owned and operated by Messrs. Moris & Elling; W. W. Moris, Manager; J. Rooney, Superintendent and Foreman. Twenty-one miners find employment and four men on the surface. Six tunnels have been driven on this property, ranging from 1500 feet, the longest, to 600 feet, the shortest. From the bottom of the lowest tunnel to the surface is some 1300 feet along the dip of the vein. With the exception of the lowest tunnel they are all connected with an upraise, and it is connected with a parallel tunnel driven on a separate vein about 100 feet from it. Timbering is done with tunnel sets and stulls. The means of escape are fully provided and ventilation is, generally, good. In running drifts a considerable distance beyond the air course, the Superintendent has adopted the wise economy of putting in blowers operated by compressed air or steam as most convenient, supplying the men working in these places with an abundance of pure air, keeping them in good health and spirits and enabling them to work these drifts without any of the loss of time attendant upon foul air or gases occurring from explosives. Seven Rand drills, operating by compressed air, are in constant operation. A 20 stamp mill, located at Pony, is kept running the greater part of the year and would be constantly operated were it not that the water which furnishes the power freezes during the extremely cold season. The greater part of the ore is free gold.

Revenue Mine, located at Richmond Flat, seven miles south of Norris, owned and operated by the Revenue Mining Co., Laurance Harris, Manager; West Crowell, Superintendent; Harvey Foster, Foreman, em-

employs thirty miners and three topmen. The main shaft is two compartments and 160 feet deep, about 70 feet of which is vertical and the balance inclined. The hoisting plant consists of a 15 H. P. Kendall & Roberts engine, 3-4 inch steel rope and bucket. While there are two openings, the protection afforded is not equal, the men working on the west side of the mine being required to travel a part of the main shaft to connect with the escape opening. I pointed out the risk connected with this to those in charge and received assurance that it would be remedied, which would require but a small outlay to do. Ventilation is fairly good. Stulls and props are principally used in timbering. The ore is base and is treated by the cyanide process, the company operating a 50 ton plant about 1 1-2 miles from the mine.

Parnell Mine, situated at Newhouse, three miles from Norris, owned and operated by the Montana Boy Consolidated Mining Co.; T. R. Henahan, Superintendent and Manager; employs ten miners and seven topmen. Hoisting is done through a two compartment shaft, 50 feet deep, with a whim, 1-2 inch steel rope and bucket. Stulls and props is the method of timbering. Ventilation is very good. A second opening has been provided but needs timbering. I advised that it be done, which was agreed to by the gentlemen in charge. Character of ore is free gold, and it is treated in the 20 stamp mill run in connection with the mine.

Chili Mine, located at Sand Creek, about three miles from Sappington, on the N. P. Ry., owned by Thos. Gibbons, operated by Dr. Grigg & Co., of Butte. Dr. Grigg manages the property while Frank Faley attends to the practical end of affairs around the mine. Nine miners and two topmen are employed. A two compartment shaft, 100 feet in depth, with a 30 H. P. Ledgerwood engine, 3-4 inch steel rope and bucket are used in hoisting the product to the surface. There are two exits which furnish the desired protection as well as supply a plentiful amount of air. The ore is free gold and is treated in a five stamp mill attached to the mine.

Mayflower Mine, owned and operated by the Mayflower Mining Co., situated about ten miles south-east of Whitehall; B. C. Leyson, Manager and Superintendent; John Stafford, Foreman. Employs 16 men underground and 4 on surface. Work is carried on through two tunnels, No. 1 is 165 feet in length while No. 2 penetrates the hill for a distance of 670 feet. Stulls are used in timbering, and ventilation is perfect. The ore is free gold and is shipped to Butte for treatment. This has proved

to be one of the richest discoveries made for some time. Mining men and prospectors are exhibiting a very lively interest in this district as shown by the amount of exploration that is going on this year.

Easton Mine, located near Virginia City, owned and operated by H. Elling and J. H. Pankey. Mr. Pankey is also Superintendent. There is a two compartment shaft, 318 feet deep, equipped with a complete hoisting plant on the property. Developing has been confined during the past year to that section of the mine opened by a tunnel 1200 feet in length. Forty miners are employed and ten men on the surface. Timbering is done with stulls. The ore carries gold and silver and is concentrated at the mine before shipping. Ventilation is very good. An upraise leading from the tunnel through the workings gives opportunity for escape at several points.

Kennet Mine, situated four miles east of Virginia City, on the Madison Divide, owned and operated by W. B. Millard; John S. Allen, Superintendent and Foreman. A two compartment shaft, 350 feet deep, Ledgerwood engine, 3-4 inch steel rope and bucket complete the hoisting plant. Fifteen miners and four topmen are employed. Character of ore is free gold. Ventilation is not good, the main shaft supplying the only means of escape and ventilation. Neither is provided for though the advantages to be derived from a second opening, (other than the safety of the employees), seemed to be fully recognized by the superintendent. I further recommended that a safety cage be substituted for the bucket then in use, as I consider a vertical depth of 350 feet much too deep for safely operating a bucket. I have learned that the owners have started the erection of a 60 stamp mill some six miles from the mine, and have concluded to work the mine on a larger scale, a force being at work putting the mine in shape to supply the demand made upon it when the mill is in operation. This will necessitate the changes recommended.

Bertha Mine, situated about four miles east of Virginia City, owned by the Bertha Mining Co.; C. L. Hathaway, Superintendent; C. F. Robbins, Foreman. A two compartment shaft, 250 feet deep, well timbered has been sunk. Hoisting is done with a whim, 5-8 inch steel rope, bucket and crosshead. Eight miners and two topmen are employed. Character of ore is free gold. A separate exit has been made and ventilation is good. Timbering is done with sets and stulls. The escape shaft was not in condition to facilitate rapid exit in case of danger, obstructions being found in places and some ladders in need of

repair. The Foreman assured me that these matters would receive immediate attention.

Thistle Mine, located at Rochester, owned and operated by the Thistle Mining and Milling Co.; J. E. Woods, Superintendent and Manager. Employs ten miners and two topmen. Work is being done through a one compartment shaft, 230 feet deep. The hoisting plant consists of a 6 x 6 Ledgerwood engine, 5-8 inch steel rope and bucket. Square sets and stulls are used in timbering. The ore carries gold, silver and lead. Ventilation is very good. An outlet for escape is provided insuring the safety of employees in case of danger from fire, flood or any of the dangers which beset the life of a miner.

Among the other promising mines in this county which deserve mention, are the Lincoln, employing ten men, operated by the Montana Mining and Smelting Co., situated on Bear Gulch; the Longfellow, operated by the same Co., under a lease, employing five miners; the Galaxy, operated by Orrin Stone, employing six men; the Hawkeye, operated by the Montana Mining and Smelting Co., on Dry Georgia Gulch, employing five men; the Fisher Mine, near Sheridan, operated by P. A. Largey and others, and the Bob Ingersoll, located on Mill Creek, operated by Rod D. Leggat, who is showing his faith in this property by sinking a good shaft and equipping it with a neat hoisting plant. Eight men are employed here in all.

LEWIS AND CLARKE COUNTY.

Drum Lummon Mine, situated at Marysville, owned and operated by the Montana Mining Co., Limited, Alex. Burrel, Manager; John Heron, Superintendent; George Burley and A. L. Marshall, Foremen. 152 miners find employment underground and 23 on top. ♦ Eight engineers are required to look after the machinery of the mine alone. Ample means of egress are provided in case of emergency. Ventilation is fairly good. The ore being free gold, enables the Company, with its milling facilities to treat ore of low grade. The safety appliances in and around the mine are not excelled in the State, consisting of safety clips on hoisting cables, which prevents the cage from being pulled into the shieve wheel, single stroke electric signal bells, electric alarm system throughout the mine, which sounds an alarm in the engine room and shows the place in the mine where danger exists or assistance is needed. The system of cage chair signals in operation if better understood would

be more generally used in the large mines throughout the State, not only as a safeguard against accident caused by running the cage into the chairs when men are on board, but also as a measure of economy to the operator, in lessening the damage and destruction of cages and the saving of time attendant upon such mishaps. A cyanide plant of 400 tons capacity per day has been installed the present year for the treatment of the immense quantity of tailings that have accumulated from the stamp mills in past years.

Cruse Mine, located at Marysville, owned and operated and managed by Thos. Cruse; P. B. Dillon, Foreman. Employs seven men underground and eleven on top. Development is carried on through a tunnel 950 feet in length, which taps a shaft 500 feet in depth. Tunnel sets are used in timbering. The gold is separated from the quartz in a 20 stamp mill recently erected on the property.

St. Louis Mine, owned and operated by the St. Louis Mining and Milling Co., situated at Marysville; Wm. Mayger, Manager and Superintendent; Chas. M. Mayger, Foreman. Employs ten miners and one engineer. Operations are conducted through a tunnel from which is sunk a 270 foot shaft. A 25 H. P. Ledgerwood engine, 1-2 inch steel rope and bucket hoists the product to the tunnel from whence it is run to the surface. There is but one opening and ventilation is rather poor. An upraise is being put through which will give a plentiful supply of air and serve as an escape shaft. I have received assurances that work on this upraise will be diligently prosecuted until completed. The character of the ore is free gold and is reduced at the 10 stamp mill owned by the company.

FLATHEAD COUNTY.

Snowshoe Mine, situated eighteen miles south of Libby on the Cabinet range owned by H. J. Lougee of Spokane and others, and operated under lease and bond by D. P. Bowers, who personally attends to the management assisted by Gus. Olson, Night Foreman. Twenty-two miners and eight topmen are employed. Two tunnels are driven on the vein, No. 1 exposing it for 750 feet of its length, and No. 2 for 230 feet. An upraise of 190 feet connects both tunnels, supplying good ventilation and a means of escape for the miners in case of danger from any cause. Sets are mainly used in timbering. Gold, silver and lead in the form of pyrites of iron and galena are the metals found in the

ore. The ores are concentrated at the mine, and shipped to the smelters at Great Falls for treatment.

Silver Cable Mine, situated on the Cabinet range, about 25 miles south of Libbey, owned and operated by the Silver Cable Mining Co.; H. L. Hackett, Superintendent and Manager, Chas. Seifert, Foreman. Eight miners are employed, also two topmen. Development is carried on through a tunnel, 325 feet in length, from which an upraise leading to the surface has been put in. The quartz carries gold, silver and lead. Ventilation is excellent, and a means of escape is furnished through the upraise mentioned. The mine throughout is in a very safe condition. The ore is transported from the mine to the concentrator, over a gravity tramway, 3000 feet in length. The concentrator is of fifty tons capacity. All these improvements were added during the past year.

Keystone Mine, located at Sylvanite, in the extreme western part of the State, owned and operated by the Keystone Mining Co., R. K. Neil, Manager; Jesse Coulter, Superintendent and W. M. Anderson, Foreman. Eighteen miners and eight topmen find employment. Work is done through a tunnel 200 feet in length and ventilated by an upraise leading from the inner end of the tunnel to the surface. This also provides an outlet in case of emergency. Square sets and stulls are used in timbering. The values are gold, silver and lead. Treatment takes place in a 10 stamp combination gold and silver mill, situated about 1 1-2 miles from the mine and operated by water power. Every precaution is taken in the interests of the employees.

Gold Flint Mine, situated at Sylvanite, operated by the Gold Flint Mining Co., C. H. Bartlett, Superintendent and Manager, Martin Murray, Foreman. Eight miners and one topman are employed. The mine is developed some 200 feet deep by a tunnel 360 feet long. Gold, silver and lead are the metals contained in the ore. Ventilation and exit are provided for by an upraise connecting the tunnel with the surface. A force of men is busily engaged in erecting a 20 stamp, combination gold and silver mill to treat the ores of this mine, and it is expected to have this completed and running by the first of December of the present year.

BROADWATER COUNTY.

Stray Horse Mine, located about six miles from Winston, owned and

operated by the Ajax Mining Co.; Mike Shovlin, Superintendent; John Boley, Foreman. The mine is developed through two tunnels, the main working tunnel being in a distance of 1200 feet, and well timbered throughout with sets. The vein and wall are of a character highly favorable to cheap mining, very little timber being used in stoping and only merchantable ore is handled by the miner. Sufficient poor gangue matter is found in the vein to keep it filled to the working faces, thus saving the cost of timber and time consumed in putting it in place, besides being much better for the purpose, as timber will in time decay, allowing the walls to cave while by the filling method, time will but solidify the material. Fifty-five miners and six topmen are employed. Ventilation is excellent and means of escape in case of emergency is met by several openings. The condition of the mine, as related to the comfort, convenience and safety of the miners, reflects much credit on the gentlemen in charge. The values contained in the ore are gold, silver and lead, and are treated at the East Helena Smelters.

East Pacific Mine, situated about five miles from Winston, owned by R. A. Bell; C. E. Gabel, Manager and Superintendent, D. E. Blair, Foreman. Fifty miners and six topmen are employed. The mine is developed by three tunnels, the two working tunnels being 1800 feet and 2700 feet in length. Sets and stulls are used in timbering. With the exception of the manner of handling powder and caps, the mine is in excellent shape, and this, the gentleman in charge, promised to remedy. Connection is maintained between the separate tunnels, insuring an abundant volume of pure air and providing easy and rapid means of exit in case of need. The ore is of the same general character as the Stray Horse and is treated at the same works.

Diamond Hill Mine, owned and operated by the Diamond Hill Gold Mining Co., Limited, was managed by Mr. Thos. Ewing to July of the present year, when he resigned and was succeeded by Mr. W. B. Fisher. Mr. Thos. Doran, occupies the position of Foreman. Sixteen miners and nine topmen have been employed. The mine is developed through two tunnels, the main one being 1400 feet long, 8x8 in the clear and double tracked. Three upraises lead from this tunnel to the surface supplying good means of ventilation and exit. Square and tunnel sets are used in keeping the mine open. The character of the ore is free gold on top and pyrites below. The past year has seen the erection of one of the largest and most complete milling and electric power plants in Montana. The mill was erected by the Union Iron Works, of

San Francisco, and consists of 120 stamps and 48 concentrating vanners, having a capacity of 450 tons per day of 24 hours. The power plant is situated on Crow Creek, about 3 1-2 miles from the mill. In accordance with orders issued from the home office in Glasgow, Scotland, the works were closed down on October 1st. No statement of the reason for this action has been given, but from the best obtainable information I am led to believe that the suspension is but temporary. The future of the Diamond Hill is of great importance to that branch of mining which, by using modern mechanical appliances in mining, handling and treating large quantities of low grade ore at the minimum of cost, expects to effect a saving which will yield reasonable returns on the investment. It is to be hoped that this company will meet with the success which the enterprising spirit displayed deserves.

H. & H., located at Winston, owned and operated by C. N. Clark & Co.; H. P. Clark, Superintendent and Manager. Work for the past season has been confined to the surface deposits, which are numerous and of good paying quality. A system of leasing has been put in practice by the management with satisfactory results to both parties. Twelve miners find employment or are their own employers as long as they comply with the provisions under which the leases are granted.

MISSOULA COUNTY.

Iron Mountain Mine, situated at Pardee, owned and operated by the Iron Mountain Mining Co.; Rob't. Angus, Superintendent and Manager; Chas. Roat, Foreman. Has employed during the past year seventy-five miners and sixteen topmen. Operations are conducted through a tunnel 875 feet long, from which is sunk a two compartment shaft 1090 feet deep. From the tunnel level vertically to the surface is 700 feet, making the depth attained 1790 feet. The mine is equipped with a 125 H. P. Ledgerwood engine, 1 1-8 inch steel rope and double deck safety cage. Tunnel sets and half sets is the system employed in timbering, though around the chutes and manways it has been found necessary to fill the space between the walls with timbers to keep them open. The ore is silver and lead and is concentrated before shipping. Ventilation is not good. The management anticipating closing down, allowed the air course and escape way to squeeze so badly that it was useless for either purpose. The Iron Mountain has been one of the most faithful

producers in the State, yielding its wealth in dividend paying quantities for a long period of time, and is ready to continue doing so when the price of the metals will warrant the owners in expending a sum sufficient to equip the mine for deeper development.

CASCADE COUNTY.

Florence Mine, situated at Neihart, owned and operated by the Florence Mining Co.; A. M. Henry, Manager, Daniel Leeny, Superintendent, James Marr, Foreman. Twenty-four miners and nine topmen are employed. The main shaft is 300 feet deep and two compartment. The shaft is sunk from the level of a tunnel which pierces the mountain for a distance of 519 feet. The hoisting plant consists of a Ledgerwood engine, 5-8 inch steel rope and bucket. Timbering is mainly done with stulls. There is an opening independent of the shaft from the 300 foot level to the surface which furnishes excellent air and serves as an exit in case of danger from fire, flood or other causes. Character of ore is sulphide carrying silver and lead. The safety and comfort of the underground workers are carefully looked after by Mr. Leeny, who, while not neglecting the interests of the company, reasons truly that the efficiency can only be obtained by anticipating the wants of the men.

Galt Mine, situated at Neihart, owned and operated by the Galt Mining Co.; Jonathan McAssey, Superintendent and Manager, A. Nelson, Foreman. Employs twenty-three miners and four topmen. Three tunnels have been driven on the vein, the main working tunnel penetrating the hill for a distance of 1800 feet. Tunnel sets are principally used in timbering. Little timber is needed in stoping as sufficient waste matter is found in the lead to fill the space between the walls as the ore is extracted. Character of ore is sulphide, the values being silver and lead and it is treated at the Great Falls smelters. Ventilation is perfect, supplied by an upraise which connects the various tunnels with the surface. This upraise also serves as an escapement in case of emergency. The precautions taken for the safety and the interest manifested in the direction of insuring conditions favorable to comfort and health, leave nothing to complain of.

Broadwater Mine, located at Neihart, owned by John E. Searles, operated by the United Smelting and Refining Co.; J. H. Henley, Super-

intendent and Manager, Chas. Butler, Foreman. 107 miners and 5 topmen are employed. Operations are carried on through three tunnels of 2000 feet each. Square sets is the system of timbering mostly employed with stulls to a lesser extent in the stopes. The ore is sulphide and the precious metals are represented in silver and lead. Smelting is done at the U. S. & R. Co's. works at Great Falls. There are six ways of entrance and egress to and from the mine. The volume of air furnished is unusually good both in quality and quantity. The protection afforded the miners by these many openings as a means of exit, suffice for any contingency which might arise.

Among the other mines which have been in operation in this district and have added materially to the mineral output, are the Benton Group, located about seven miles from Neihart, under the management of Mr. J. C. C. Baker. This mine has proved to be one of the most profitable producers of this district. Ten miners, mostly under lease, have been employed. The mine is developed through two tunnels and the laws are generally complied with.

The Big Seven Mine adjoins the Benton Group, and is owned by the Barker Bros.; Edwin J. Barker, Manager. Two tunnels tap the vein at considerable depth. The ore is silver lead of high grade. This mine has been a good producer for the greater part of the past year. Eight men are employed and the mine is in good working condition.

FERGUS COUNTY.

Gilt Edge Mine, located at Gilt Edge, operated under lease and managed by E. W. King; W. J. Littlejohn, Foreman, employs 18 miners and 25 topmen. It is worked through a tunnel 135 feet long. Timbering is done with tunnel sets and stulls. Gold is the principal value contained in the ore. There are several openings to the surface insuring good air and means of exit. The product is treated by the cyanide process in a mill of 100 tons capacity erected near the mine. The mine was in rather bad condition. Several places I considered more or less dangerous for want of timbers. The Superintendent assured me before leaving that he would put men at work and continue at it until the mine was in good condition.

Spotted Horse Mine, located at Maiden, owned and operated by J. L. Bright; A. L. Losonger, Superintendent; J. K. Mansfield, Foreman, em-

employs seven miners and two topmen. The mine is developed through a two compartment shaft, 380 feet deep, with a 7x12 Kendall engine, 1 1-8 inch steel rope and safety cage. The safety apparatus is tested each week. Gold is the metal produced. Ventilation is good. While there is an outlet independent of the shaft, it is only beneficial for ventilating purposes, no attention being given to maintaining it in a proper condition as an escape outlet. When the attention of the gentlemen in charge was called to the law on this subject, they expressed a readiness to comply with its provisions forthwith. I also found that the law requiring the easing in of cages was not observed, but was given to understand that the failure to comply with this law was due to the failure of the necessary material to arrive as ordered.

COAL MINES—CARBON COUNTY.

The mines of the Rocky Fork Coal Co., are situated at Red Lodge, the County seat of Carbon County, and are under the management of Dr. J. M. Fox, with Wm. O'Connor as Superintendent and Martin Weed, Pit Boss. The ventilation and general condition of the mines is all that can be desired. Mr. O'Connor believing that the Company's interests are best served and the best results obtained from the men by employing every agency that will promote their safety, health and comfort. 300 miners are employed in the mine and 25 men find work on the surface. The extent of the workings can best be estimated when we consider that forty miles of track are laid in the mine. The mine is timbered with sets and props. Hoisting is carried on through an incline or slope with a pitch of twenty per cent. by means of a 350 H. P. Litchfield engine and one inch steel rope. Six hundred tons of coal are hoisted per day, which is mostly disposed of in the local markets. Four exits are maintained to provide for emergencies, while their ventilating fans are capable of supplying over 50000 cubic feet of air per minute. Forty mules are required in hauling the product from the various workings to the main slope. Fire plugs and hose protect the surface buildings from fire.

Gebo Mine, situated about 6 miles from Joliet, owned and operated by the Southern Montana Coal Co., Mr. Strohm, Manager, S. W. Gebo, Superintendent. Ten miners and four topmen are employed. A slope is being sunk on the vein, which has a dip of about 4 per cent. Every-

thing done so far is of a very substantial and workmanlike character and speaks well for the future care of the mine. The slope has been driven 1000 feet and work on it continues to be vigorously pushed. The extent and quality of the coal measures exposed in developing this field leads to the conclusion that the coal mining industry is but in its infancy and if favored by conditions which will promote its growth will, in time, rival the older metal industries.

GALLATIN COUNTY.

Chestnut Mine, located about eight miles east of Bozeman, owned by the N. P. Ry. Co., operated by Johnson & McCarthy, under lease, J. C. McCarthy, Manager, John Smith, Pit Boss. Operations are conducted through two tunnels, No. 1 tunnel piercing the hill for a distance of 5500 feet, and No. 2 for 4500 feet. 150 miners are employed underground and 15 men on the surface. The mine is fairly well ventilated by means of fans which furnish a sufficient supply of air for men and animals. Excepting in the main entry manways and chutes very little timber is used, as enough waste comes from the vein to keep the workings filled. A very good quality of bituminous coal is produced to the amount of 350 tons per day, which finds a market at the smelters throughout the state. The mine is worked in a very systematic and safe manner under the efficient management of Mr. McCarthy, ably assisted at the practical end by Mr. John Smith.

CASCADE COUNTY.

Belt Coal Mine, owned and operated by the Anaconda Co., P. W. C. Whyte, Manager, J. J. Kenney, Superintendent, John Haynes and Peter Breen, Pit Bosses. 935 men are employed underground and 175 on the surface. The main working entry driven on the vein is in a distance of one and one quarter miles, and is timbered in part with drift sets. A powerful Litchfield engine, one inch steel rope and cars constitute the hoisting apparatus. Electric signal bells are in use. There are three exits and the volume of air supplied is 150 cubic feet per minute for each man. The rooms are timbered with props, a plentiful supply of which is kept in each room. The mine is worked on room

and pillar system, 450 feet between cross-entries, with 25 foot pillars between cross-entries and 35 foot pillars between the main entry and main air course, on either side thereof. Rooms are turned every forty feet, having a width of twelve feet at the entrance, then widened out to thirty feet, thus leaving a ten foot pillar between rooms. The grades are variable, forming basins and necessitating the use of eight pumps. Forty-five cars are hauled out each trip, averaging 2 1-2 tons to the car. The average daily output is 1850 tons of lump, 600 of slack and 500 tons of coking coal. Sixty mules are worked underground and four donkey engines. A Murphy fan, 20 feet in diameter, ventilates the mine. 27 Ingersoll-Sergeant coal cutting machines are in use. Up to this time neither fire damp nor black damp has been detected. The surface equipment consists of two large air compressors which furnish power to operate the underground engines, pumps and coal cutting machines. A Dixon engine 24 x 48, single cylinders, operate the washers, of which there are two, with a capacity of washing 500 and 700 tons respectively. Nothing seems to be wanting that can be employed to advantage in any department of these works.

The Sand Coulee Mine, owned and operated by the Sand Coulee Coal Mining Co., Lewis Stockett, Manager and Superintendent; Wm. Hagstrom and Jas. Cummings, Pit Bosses, employs 500 miners and 100 others in the surface department. The main entry is 9000 feet in length, from which entrys and drifts, aggregating 17 miles, are driven. There are thirty-two mining and ten drilling machines in use. Eleven engineers find employment in and around the mine, while 65 mules are required to haul the product from the workings to the haulage rope. Ventilation is supplied by fans in sufficient quantity for all purposes. The average product is 1800 tons per day most of which is consumed by Great Northern Railway Co.

PARK COUNTY.

Montana Coal and Coke Company, situated at Aldridge, Montana. Henry Burrell, Manager; Henry Welch, Superintendent, and Thos. Lindsay, Pit Boss. Employs 175 miners and 75 topmen. Operations are carried on through a main entry 3600 feet long. The product, which is 400 tons per day is hauled to the surface by mules, and run through a washer that separates the slate and dirt from the coal. After this

process the clean coal is carried down the mountain for 2 1-2 miles in a flume and converted into coke in the company's ovens at Horr. Timbering is done with tunnel sets and props. There are two exits and ventilation is good. This mine was closed down during the greater part of the summer owing to difficulties arising between the management and the men, and resulted in a change of management, placing Mr. Henry Burrell in charge, who by fairness and tact settled the difficulty and established better relations between the management and the employees.

Cokedale Mine, No. 2, owned by the Livingston Coal and Coke Co., operated by Oscar James, under lease, employs twelve miners and three topmen. The product is hoisted through a slope 300 feet in length, equipped with a 40 H. P. engine and tail rope. Ventilation is fair, natural means only being resorted to up to the present time. 20 tons of a good quality of bituminous coal is produced daily, with the certainty of constant increase in tonnage as the mine is opened up. An opening for safety purposes is already made, though not a satisfactory one. Mr. James consented to either carrying out the suggestions made or put in an entire new opening. Timbering is done with props and tunnel sets.

FIRST ANNUAL REPORT

OF

DEPUTY STATE MINE INSPECTOR

FRANK HUNTER.

Mr. John Byrne, State Mine Inspector,
Helena, Montana:—

I herewith submit my first Annual report for the fiscal year ending November 30th, 1897.

The list of mines which I have inspected is also submitted, together with suggestions made after careful consideration, which if acted upon favorably may prove of some benefit.

The report also embraces the fatal and non-fatal accidents which I have investigated. Only the more serious of the latter are here reported, as I did not deem the cases where slight injuries were sustained worthy of being embodied in this report.

Trusting that the report will be acceptable to you and meet with the approval of His Excellency, the Governor, I have the honor to be,

Your obedient servant,

(Signed)

FRANK HUNTER.

Dated, Butte, Montana, December 1st, 1897.

General Remarks.

Although operations at all the silver producing properties in Montana have been limited this year by the depression of the silver industry, there has been a greater amount of development work done on the copper properties than during any preceding year. The shafts have been enlarged and deepened and the work has been of a permanent character. In many of the copper properties larger and better hoisting machinery has been placed in position. The mines of Silver Bow County are, generally, in good condition.

I desire to add here that my thanks are due to those who so kindly lent their assistance during my official inspection of the mines and gladly furnished all information needed.

POWDER.

I am pleased to report that in all the mines visited by me I find better precautions are being taken to keep the powder and caps separated in the mine storehouses. By adopting this measure, there is very little danger of explosions, as in every case where explosions have occurred about powder houses, they were due to having the caps and powder in the same locality.

FINGER BOARDS.

I have urged the placing of finger boards in each mine inspected, and at present time all the mines within my jurisdiction are so supplied. Their cost is but nominal and their advantage in case of fire or other accident, are many.

CALL BELLS.

The matter of call bells in mines is something that should receive more consideration from mine owners and operators. The flash light system devised by J. W. Leonard, and in use at the Rarus, is a great improvement over the old system of knocking on the water column to notify the Station Tender that his presence is desired on any station.

ELECTRIC GONGS.

Many improvements may be made in Montana mines in the matter of signals. Electric gongs would prove a decided benefit in many of the deep mines of the State. They could be used in conjunction with the old style bell rope, as the use of the latter could not be entirely discarded, owing to the frequent need of making repairs in the shaft.

EXITS.

I am pleased to state that the law passed by the last legislature making it compulsory to have two means of exit in mines having shafts over 100 feet deep, has been, generally, complied with. The law however, applies only to mines where the shaft house is directly located over the shaft. In my opinion the law is not sweeping enough, and should include all shafts, so as to afford a means of exit in case of fire or other danger.

FATAL ACCIDENTS.

Name.	Date.	Mine.	County.	Cause.
1 Joseph Kane...	Dec. 1, 1896.	St. Lawrence.....	Silver Bow	Cave of earth
2 James McCann..	Dec. 27, 1896.	Never Sweat	"	Cave of earth
3 John Doyle.....	Dec. 29, 1896.	Diamond	"	Fell from cage.....
4 Frank Upton...	Jan. 9, 1897.	High Ore.	"	Fell down manway
5 John Nolan	Jan. 21, 1897.	Bell	"	Crushed between cage and wall plates.....
6 Jno. Harrington	Jan. 28, 1897.	Mountain Con ...	"	Cave of rock
7 Tim McCarthy..	Feb. 1, 1897.	Green Mountain ..	"	Blast in mine.....
8 R. W. Lombard..	Feb. 7, 1897.	Mountain Con.....	"	Cave of earth.....
9 Chas. Horsfall ..	Feb. 23, 1897.	Colusa-Parrot.....	"	Fell down ore chute
10 Jerry Shanahan	Mch. 3, 1897.	St. Lawrence	"	Explosion in missed hole ..
11 John Cushing...	Mch. 6, 1897.	Bell	"	Fell down chute
12 E. C. Leonard...	Apl. 20, 1897.	Mountain Con No 1	"	Blast.....
13 Richard Brady ..	Apl. 21, 1897.	Moonlight.....	"	Fell down shaft.....
14 Allan Anderson	May 9, 1897.	Gagnon	"	Cave
15 Jos. Smollock..	May 10, 1897.	Sand Coulee.....	Cascade.....	Killed by tall rope.....
16 Matt O'Hara....	May 13, 1897.	Diamond.	Silver Bow	Cave
17 Edward Penrose	June 5, 1897.	East Gray Rock ...	"	Struck on head by cage
18 Jacob Kojala...	June 15, 1897.	Sand Coulee.....	Cascade.....	Fall of coal.....
19 Vaso Bielich....	July 1, 1897.	Original	Silver Bow	Crushed between skip and timbers.....
20 James Dempsey	July 12, 1897.	Never Sweat.....	"	Cave
21 P. Harrington..	Aug. 1, 1897.	St. Lawrence No. 1	"	Cave
22 W. J. Meagher..	Aug. 4, 1897.	Never Sweat.....	"	Blast.....
23 Joseph H. Unvel	Aug. 12, 1897.	Mountain Con No 2	"	Runaway cage
24 Jacob Rinda....	Aug. 27, 1897.	St. Lawrence No. 2	"	Cave
25 Dennis Call	Sep. 8, 1897.	Green Mountain...	"	Cave
26 James Lowrey ..	Sep. 10, 1897.	Leonard.....	"	Fell down shaft
27 James Harkins..	Sep. 16, 1897.	Never Sweat.....	"	Crushed between skip and timbers.....
28 Patrick Griffin .	Sep. 17, 1897.	Never Sweat.....	"	Struck on head by cage
29 Samuel Curnow	Sep. 22, 1897.	Elkhorn.....	Jefferson	Blast.....
30 Mich'l Connors.	Sep. 24, 1897.	Bell	Silver Bow	Fell down a chute
31 John Kurzilla ..	Oct. 9, 1897.	Sand Coulee.....	Cascade.....	Fall of coal.....
32 Joe Borlean	Oct. 11, 1897.	St. Lawrence.....	Silver Bow	Run into the sheaves.....
33 Con Cronin.....	Oct. 11, 1897.	Diamond	"	Crushed between cage and timbers.....
34 Jno. H. Sullivan	Nov. 25, 1897.	Never Sweat.....	"	Fell down Pump shaft.....
35 John Goss.....	Nov. 26, 1897.	Original.....	"	Blast.....

NON-FATAL ACCIDENTS.

Name.	Date.	Mine.	County.	Cause.
1 Patrick Dolan..	Mch. 15, 1897.	Poulin.....	Silver Bow.....	Leg broken.....
2 Joe Polkinghorn	Mch. 25, 1897.	Mountain View ...	"	Ribs broken by falling down chute
3 Chas. Warner..	Mch. 25, 1897.	Bell.	"	Badly bruised from falling down chute.....
4 John McGrath ..	Mch. 26, 1897.	Anaconda	"	Severely bruised by cage ..
5 Leland Kivave ..	Apl. 5, 1897.	Gagnon	"	Badly bruised from blast...
6 Oscar Luma....	Apl. 5, 1897.	"	"	Badly bruised from blast...
7 And. Donnelly...	Apl. 16, 1897.	Diamond	"	Ribs broken from cave
8 Michael Driscoll	May 6, 1897.	Bell	"	Leg broken from the chairs breaking.....
9 Ralph Howe....	May 10, 1897.	Sand Coulee.....	Cascade	Three ribs broken
10 Joseph Hyland..	May 23, 1897.	Bell	Silver Bow	Legs broken.....
11 Sam'l Williams.	June 17, 1897.	Parrott	"	Serious internal injuries...
12 James Crowley.	July 13, 1897.	Diamond	"	Leg broken by cave.....
13 Jas. J. Murray..	Aug. 4, 1897.	Never Sweat.....	"	Injury to eyes from blast...
14 Jerry Morrissey	Aug. 12, 1897.	Mountain Con No 2	"	Back broken
15 Edw'd M. Ryan..	Aug. 15, 1897.	Diamond	"	Leg broken by falling down manway
16 Emman'l Tyron	Nov. 9, 1897.	Green Mountain...	"	Leg broken.....
17 Dennis J. Shea.	Nov. 29, 1897.	Diamond	"	Leg broken.....

FATAL ACCIDENTS.

SILVER BOW COUNTY.

John Cushing, miner, killed March 6th at about 12 A. M. by falling down a chute a distance of 160 feet. Cushing and his partner, J. C. Wallace, were working on the eighth floor of a raise on the 1100 foot level. The floor beneath them was the opening of a chute running to the 1200 foot level. The chute was of the usual size, 5 feet x 4 feet. Over it were two 10 x 10 on one side and on the other two 2 inch planks 10 inches wide and in the center a 5 x 10. A space of about 5 inches was left open on each side. They were notified that it was time to go to dinner and started down the raise, Wallace leading. Wallace jumped down a distance of about 4 feet to the 5 x 10 in the center. The timber bore his weight all right, but when Cushing jumped onto it the plank broke and he fell to the 1200 foot level. When taken out, he was dead. The Coroner's jury returned a verdict of accidental death. He was an American by birth. This accident occurred at the Bell mine.

Eugene C. Leonard, miner, in the Mountain Con. Mine, April 20th, died the following day from injuries. American by birth. With his partner, Pat Breslin, Leonard was working on the 4th floor of the 1000 foot level. About 11:20 o'clock, A. M., they went up to the 900 foot level for timbers. At noon they started back to where they had been at work. While in the manway on their way down they heard three shots and thinking this was all they continued on their way down until they reached the fifth floor when another blast went off. Leonard was struck by a rock and received a terrible cut in the face. James Leahy and James McCafferty, who had fired the hole testified at the inquest that they had fired four holes and then yelled "Fire," and gone down to the 1000 foot level to keep any one from coming up that way. John Downey and James Kilroy were working on the 6th floor. They also fired a round of four holes at 11:56 o'clock A. M. and after spitting the fuse they shouted "Fire", up the manway, but as it was so close to the noon hour and thinking nobody would be coming down that way, they went down to the 1000 foot level for their lunch. I was at the mine when the accident occurred and went below and made a thorough investigation of the case. I found that the men on the 6th floor

were to blame, for one of them should have gone up the manway, and also that Leonard and his partner were too anxious to get down when they found it was the noon hour. The verdict of the Coroner's jury was that Leonard's death was due to his own carelessness.

Richard Brady, miner, Moonlight Mine, April 21st, killed almost instantly. A native of Ireland. Brady and his partner, John Lenahan, were working on the 600 foot level. They were enlarging the shaft from a two to a three compartment shaft, and had finished the first 100 feet of the new compartment. The main shaft is 750 feet deep and this brought them up to the 600 foot level. Brady and his partner were about to clean down the shaft and had one set cleaned off, and were putting down a plank platform on the set below the station at the 600 foot level. Brady was handing down the 2 inch plank to Lenahan, who was putting them in place. After Lenahan had the shaft covered over, Brady jumped down, to where he was, a distance of about 5 feet. When he alighted on a knotty plank it broke in two and as there were bulkheads every 20 feet in the shaft, he must have struck against them on his downward course. He fell a distance of 90 feet on a pile of rock in the bottom of the shaft and died one hour after being removed to the surface. The jury brought in a verdict of accidental death.

Allan Anderson, shoveller, Gagnon Mine, May 9th. Native of Canada. Almost instantly killed by a fall of ground in the west drift of the 1400 foot level. Was shevelling with a partner, Dugald McDonald, when a piece of ground, weighing about 1 1-2 tons, fell from back of drift, striking Anderson and knocking him down. Died thirty minutes after removal to hospital. Dan Sullivan and T. Jacobs, who were working in the drift, stated that the day before the accident they had picked down the back and everything seemed to be perfectly safe. I made an examination after the accident and found a seam of soapy matter back of where the ground had fallen from. I also found that the ground was of a porous nature and, in my judgment, a miner might have tried the ground and found it all right and a few minutes later it could have fallen away. The verdict of the Coroner's jury was that it was an unavoidable accident.

Matt O'Hara, miner, Diamond Mine, May 13th, 1897. Instantly killed about 9 P. M. Was working on 11th floor of the 500 foot level, with Mike Powers. They were getting down timbers from the 400 foot level of the 8th floor of the 500 foot level. Thinking that they could get their timbers down through an old worked out

stope, instead of getting them down through the regular timber chute, they decided to adopt the former way, when at a point about 14 feet below the 400 foot level, a piece of ground, about 1200 lbs. weight, fell from the hanging wall and struck O'Hara. The ground fell a distance of about 18 inches, O'Hara's neck was broken. From my investigation I found that O'Hara had no business to take the timbers down except in the regular manner and the Coroner's jury found that carelessness on the part of the deceased was the cause of his death. He was a native of Ireland.

Edward Penrose, miner, East Gray Rock, June 5th, 1897. Struck by a descending cage and knocked from the 700 to the 1400 foot level. From my investigation I found that the east side cage was used by leasers, Penrose being one of the latter. After firing a round of holes he went to the station to ring for the cage to bring down the timbers. While in the act of pulling the bell rope, the descending cage on the east side struck him on the head knocking him down the shaft. Edward Libby testified that he saw Penrose when he was struck by the cage, and that the latter turned over and fell on top of the cage after it had passed. When the body was found life was extinct, the body being badly mangled. Coroner's jury returned a verdict of accidental death. Penrose was a native of Cornwall, England.

Vasso Bielich, miner, Original Mine, July 1st, 1897, 2 P. M. He was caught between the skip and the wall plates while putting drills on the skip, and was instantly killed. Bielich was working on the 1000 foot level and after loading the skip gave one bell to hoist. Engineer Collins, being engaged did not instantly obey the signal. Instead of waiting for a response from the engineer, Bielich climbed on the skip to put on some dull tools. While in the act of doing so the engineer started to hoist the skip. Bielich was caught at the station set and thrown off and after being crushed between the wall plates and the skip fell to the sump, 15 feet below, and was dead when taken out. Coroner's jury brought in a verdict that his death was due to his own carelessness. He was an Austrian by birth.

James Dempsey, miner, Never Sweat. Injured July 12th, 1897, by a fall of ground. Died of his injuries at Sister's Hospital, September 5th. His back was broken. Dempsey was working in a raise at the 800 foot level, when a piece of ground, weighing about 400 lbs. fell away from the hanging wall, striking him on the back. The falling ground was occasioned by the jar of the Burleigh drill in use at the

time. Was removed to the Sister's Hospital where he lingered until September 5th. Coroner's jury returned a verdict of accidental death. He was a native of Ireland.

Peter Harrington, shoveller, St. Lawrence, No. 1 Mine, Aug. 1st, 1897, was instantly killed by a fall of ground. Harrington was working in the south-west drift of the 1200 foot level. He and his partner, Jacob Kleinbach, were shovelling behind two miners. One of the miners notified the two shovellers that there was some ground overhead that looked dangerous. They tried with bars to work the piece down but without success. Then one of them went after powder to shoot it down, and at the same time told Harrington to keep away from it until he got back with the powder. Michael Boylan, the other miner, also told them to keep back. Kleinbach also testified that the miners had warned them to keep away. Harrington failed to heed the warning. The rock, weighing about 2 tons fell, striking Harrington and killing him instantly. The Coroner's jury returned a verdict that he came to his death from his own carelessness. He was a native of Ireland.

W. J. Meagher, miner, Never Sweat, Aug. 4th, about 5:30 P. M. Injured by a blast from which he died a few hours after being admitted to the hospital. Meagher was working at the 1300 foot level with James G. Murray and had six holes to fire on the west sill floor. One of the holes failed to take and the men went back. Just as they reached the breast the hole exploded striking Meagher on the face and body, knocking him down. Murray, who was a few feet behind, was knocked down by the force of the explosion. Meagher was removed to the hospital where it was found that he had received serious injuries, dying a few hours later. The Coroner's jury returned a verdict that his death was due to his own carelessness. Meagher was an American by birth.

Jacob Rindi, miner, St. Lawrence, No. 2, Aug. 27th, 2 o'clock A. M. Injured by a cave of ground, and died on September 7th at Sister's Hospital. He was working on the west sill of the 300 foot level where he and John Steneshen were engaged in putting down a mud sill, when about three tons of ground fell on Rindi. His partner stated to the Coroner's jury that he told the deceased to come out, that the ground was bad, but he continued to work until the ground fell upon him. Coroner's jury brought in a verdict that his death was due to his own carelessness. I was not notified of the accident, but attended the inquest. He was a native of Finland.

Joseph H. Duvel, Station Tender, Mountain Con. No. 2, August 12th, 1897. Injured in a runaway cage and died from injuries Aug. 17th. He and his partner, Jerry Morrisey, were working on the 1100 foot level and gave the signal to be lowered to the 1300. They were on the east side cage. The engineer, Thomas R. Denny, in lowering allowed the cage to get beyond his control and it dropped at a terrific rate of speed until it struck the bulkheads about 18 feet below the 1300 foot station. The cable ran off the reel and piled on top of the bonnet of the cage. Jerry Morrisey stated to the jury that after he gave the signal to be lowered the cage went down all right but then began to travel at a terrible speed. Denny also stated that he had taken a few drinks that day but was perfectly sober at the time of the accident. He did not know the cause of it. Pat Heany, whom Denny relieved, stated that the engine was in good order when he turned it over to Denny. The Coroner's jury, after hearing all the evidence in the case, brought in a verdict of negligence on the part of Thos. R. Denny, the engineer. Denny was immediately arrested on the charge of manslaughter but was acquitted of the charge by a jury in the District Court on October 20th. The deceased was a native of Canada.

Dennis Call, miner, Green Mountain Mine, injured Sept. 8th, by a fall of ground and died Oct. 12th, 1897. He and his partner, Edward Buzze, were working on the 1300 foot level on the hanging wall side. After going on shift in the morning, they noticed a piece of loose gorund, weighing about 150 pounds., in the back of the stope. Call took the pick to take it down, and while so doing it fell away, striking him on the back and breaking both legs. Coroner's jury returned a verdict of accidental death. He was a native of Ireland.

James Lowry, miner, Leonard shaft, Meaderville, Sept. 10th, 1897. Killed instantly by falling down the shaft. Lowry, Joseph Mitchell, T. E. McLaughlin and Thomas Treloor, were lowered to the 400 foot level, where Lowry, Mitchell and McLaughlin worked. They got off the cage, Lowry preceding the others. Believing that he was going into the drift, Lowry walked into the shaft and fell to the bottom, a distance of 420 feet. There is a drift running from the north side to the south side of the station, 4 feet wide. There are half doors made of 1 inch boards, opening outwards on the two compartments of the shaft on the north sides. His companions saw him walk into the shaft but none of them saw him open the doors. They all stated before the Coroner's jury that they noticed one of the half doors open after the

accident, but not before. Morgan Griffith, the night Station Tender, testified that he had closed the doors at 4:30 A. M., that morning, and that there had been no one down at that level between that time and the time of the accident. My belief was that one of the doors had been left open and that Lowry absent mindedly walked into the shaft believing he was walking into the drift. The jury brought in a verdict of accidental death. He was a native of Cornwall.

James Harkins, Station Tender, Never Sweat Mine, instantly killed by being caught between the skip and the wall plate, Sept. 16th, 1897. at 2:45 P. M. He and Wm. O'Donnell were tending the skip. The practice was when their time was up the engineer would "shake up" the skip. They were working 8 hour shifts. The engineer, James R. Murphy, lowered the skip to the 1200 foot level and began to shake it up. Harkins gave him a stop bell. Harkins was engaged in putting a platform on the skip to stand upon while being hoisted to the surface. While in the act of fixing the platform the engineer hoisted the skip and Harkins was caught between it and the wall plates. He was pulled through the 4 inch opening between the skip and wall plates for a distance of about 15 feet. When his partner gave the engineer a stop bell, Harkins body fell to the sump 220 feet below. Engineer Murphy stated at the inquest that he and the station tender had a private code of signals of their own, that they used one bell to hoist men to the surface, one bell to lower and one bell to go from one station to the other. He also stated that he had a proper right to do so. Pat Egan, the Foreman, stated that he had understood that the regular code of mine signals was used. This seemed to me to be a clear case of non-observance of the code of mine signals. The Coroner's jury returned a verdict that he came to his death by his own carelessness. He was an American by birth.

Patrick Griffin, Carman, Never Sweat, instantly killed by descending cage at 1100 foot level, Sept. 17th. At 4:15, A. M. he had dumped his car in the chute and went forward to the guard rail of the shaft. He must have leaned over the bar in such a position that the fast descending cage caught him on the head, knocking him over the guard rail, falling on the bonnet of the four deck cage, where he was found at the 1300 foot level, dead. James Walsh and Robert C. McNeill stated at the inquest that they noticed Griffin fall after being struck. The Coroner's jury returned a verdict that he came to his death through his own carelessness. He was a native of Ireland.

Michael Connors, Carman, Bell Shaft. Instantly killed Sept. 25th, by falling down a chute. He was working on the 1200 foot level about 350 feet from the main cross-cut. He was running a car of waste to a chute over which the plank had been removed, and he fell through a distance of 100 feet. Edward Dunn, a shoveller, stated that the track was covered with rock around the chute and that Connors lifted the plank and neglected to replace it. A verdict was rendered that death was due to his own carelessness. He was a native of Ireland.

Joseph Boileau, or as he was better known, Joseph Waters, Station Tender, St. Lawrence No. 1. Instantly killed, October 11th, 1897, by being run into the sheave wheel by Engineer Michael Maloney. They were lowering the night shift down at 7 P. M. and Boileau went down to the 1000 level with a load of men. After unloading them he gave the signal to hoist to the surface. The west side cage at this time was on the surface loaded with men for the 800 level, and engineer Maloney undertook to lower them counter-balance, giving the west side cage in charge of the brakeman while he took charge of the east side cage to hoist it to the surface. Instead of landing the cage at the surface he ran it into the sheaves. Maloney testified that Boileau jumped from the cage before the latter went to the sheaves, but no other witness corroborated his testimony. Boileau was thrown off, apparently, and his neck broken. He fell on the turn sheet. Maloney also stated that the throttle valve refused to work and that he was running very slowly. As to the throttle valve being out of order, the testimony of the Master Mechanic, brakeman, and others was to the effect that it was in good order. It was learned that Maloney was operating a first motion engine on a second class license. The Coroner's jury censured the engineer for this accident.

Con Cronin, miner, Diamond shaft. Instantly killed, October 30th, by being caught between cage and wall plates, at 5:30 P. M. The accident happened at the 1000 foot level. The men were being hoisted to the surface. Cronin, Mike Fleming and Peter Holland got on the north side with three others on the south side. The station tender called out if all were right and receiving an affirmative reply gave the engineer the signal to hoist. Mike Fleming and Peter Holland stated before the Coroner's jury that Cronin dropped the lid of his lunch basket. When the cage was about to start, Cronin stooped down to get his lunch bucket lid when the cage was pulled away. Cronin's body was caught between the station set and the cage and fell to the bottom a distance of

220 feet. The top deck had safety doors, but the lower deck had not. Had it been equipped with safety doors the accident could not have happened. The Coroner's jury returned a verdict that death was caused by his own carelessness.

John H. Sullivan, miner, employed at Never Sweat, instantly killed about 7:30 P. M. on Nov. 25th, by falling down pump shaft. The accident took place at the 500 foot level. Sullivan and his partner, Hector McKenzie, were working the night previous easing the timbers in the pump shaft, 1 set below the 500 foot level. On the night of the accident the men had been ordered to work on the opposite side of the shaft. Both men went below and after arriving at the 500 foot station, Sullivan left his partner, remarking that he would go down one set below and get a pick he had left there. In some unknown manner he lost his hold on the ladder and fell to a platform above the 600 level, a distance of 85 feet. When taken out, a few minutes later, life was extinct. Coroner's jury returned a verdict of accidental death.

John Goss, miner, employed at Original Mine. Killed by a blast on the morning of Nov. 28th on the 1000 foot level. Goss and his partners, Owen Burns, Richard Gilbert and Ed. McManus, were in the breast and had loaded 32 holes. Burns and Gilbert cut the fuse while Goss and McManus spit them. The breast was a little wet and some of the holes were slow in taking, which necessitated the cutting of four of them over again, which took several seconds to accomplish. When they had the last hole spit, they were in the act of coming away when the explosion took place. Goss was on the footwall side with Gilbert while Burns and his partner were on the hanging wall side. At this place the drift is 16 feet wide. When the first hole went off they were within a foot or two of the breast on their way coming out. The force of the explosion knocked down Burns and Gilbert but they were able to crawl out of danger before the next shot went off. This was the last seen of Goss alive. McManus made his escape. When I made the examination I found portions of Goss's body along the hanging wall. I found that 21 shots had been fired. I examined the fuse, found it was double tape fuse that had been used; also found that they were using 7 1-2 feet of fuse to each hole. I tested the fuse and found that it burned at the rate of 21 seconds to the foot, whereas had it been triple tape fuse they would have had at least one minute more time in which to have escaped. In my opinion the fuse was entirely too short for the number of holes fired and the distance the men had to go to get out of danger. The

Coroner's jury returned a verdict that death was caused by the carelessness of the men.

CASCADE COUNTY.

Joseph Smollock, Driver, employed by the Sand Coulee Coal Co., was instantly killed at the 12th south parting on May 10th, 1897, at about 11:30 A. M. It appeared that some one gave a stop signal to the engineer and the friction on the tail rope acted on the curve wheel in such a manner that the latter broke off at the arm, which caused the rope to whip back and forth in the entry. The rope struck Smollock on the back and knocked him against the rib, killing him instantly. The Coroner's jury brought in a verdict that some parties unknown must have given a stop bell for malicious purposes and through this Smollock came to his death. A reward of \$50.00 was offered by the company for such information as would lead to the conviction of the party that gave the signal.

Jacob Kogala, miner, employed at the Sand Coulee Mines, was instantly killed by a fall of coal about 8 P. M. on June 15th, 1897. The accident happened in rooms 23 and 24, tenth butt, twelfth south. John Mattson, his partner stated before the Coroner's jury as follows: "We started to work and had worked about an hour and a half. After we had cut about fifteen feet we set up the machine under some loose coal. I told Kogala to put up a prop in case it might come down. He stated that it was all right. Then we went to work and after some time we put up a prop on the left side of the machine. I wanted to put one up on the right side but Kogala would not have it. When we were about finished cutting the coal came down, several tons of it, burying Kogala and when taken out he was dead." The Coroner's jury returned a verdict of death by his own carelessness.

John Kuzilla, Machine man at Sand Coulee Mines was injured by a fall of coal October 9th and died from injuries October 13th. He and his partner, Andrew Leroma, were putting in a miring with the machine when about 1500 lbs. of coal fell away from the roof burying Kuzilla, and when taken to the surface it was found that he had received serious injuries. He was removed to Columbia hospital where he died. The accident took place in room 4, 27th butt of south entry. I arrived at

Sand Coulee Oct. 15th and found that several shifts had been worked in the place where Kuzilla had received his injuries and also that the place had been timbered up after the accident. From statement made by the Foreman of the mine and the dead man's partner I came to the conclusion that the company was negligent in not seeing that the place was properly timbered. The Coroner did not hold an inquest claiming that it was not necessary as the victim had not been killed instantly.

JEFFERSON COUNTY.

Samuel Currow, miner, employed at Elkhorn mine, was instantly killed, Sept. 22, at 7:30 P. M. on the 2300 foot level, by a missed hole. He and his partner, John Edwards, were working in the breast of the drift, when after drilling 8 holes, they lowered the machine to put in two bottom ones. They had been notified that there was a missed hole in the breast and Currow stooped to locate it. While in this position the explosion occurred, blowing Currow into fragments. Edwards was standing back of the machine and escaped serious injury. From my examination I learned that the shift that went off at 3 o'clock had fired a round of holes at about 1:30 P. M. one of them missing. They notified Currow and Edwards of the fact. The explosion took place at 7:30 P. M., 6 hours after the other holes had been fired. The men stated to me that the holes were tamped with old sacks and in my opinion the fuse got broken and the tamping held the fire until it caught the powder train again which caused the explosion. The Coroner's jury returned a verdict that deceased came to his death by an unavoidable accident and that no one was to blame.

NON-FATAL ACCIDENTS.

Patrick Dolan, a miner at the Poulin on March 15th, 1897, sustained a compound fracture of the right leg by being caught between the cage and wall plates.

Joseph Polkinghorn, a miner at the Mountain on March 25th got several ribs broken by falling down an ore chute.

Charles Warner, a miner at the Bell Mine, March 25th sustained severe internal injuries by falling down an ore chute.

John McGrath, a powder man at the Anaconda on March 26th, received severe internal injuries and scalp wounds by being struck by the cage at the 100 and falling on top of the bonnet was carried to the 300 level. This was a miraculous escape.

Lelander Kivaro and Oscar Luma, two miners employed at the Gagnon received serious injuries on April 5th by being blasted.

Andrew Donnelly, a miner at the Diamond got several ribs broken and other internal injuries on April 16th by a fall of ground.

Michael Driscoll miner at the Bell mine received a compound fracture of leg on May 6th by the cage striking against the chairs.

Ralph Howe, a driver at Sand Coulee mine, Cascade County, on May 10th had three ribs broken by a curve wheel breaking.

Joseph Hiland a miner employed at the Bell had both legs broken on May 23 from being knocked from cage onto station.

Samuel Williams a miner at Parrot on June 17th received serious internal injuries by a cave of ground.

James Crowley, a miner at the Diamond, on July 13th, had a leg broken by a cave of ground.

James J. Murray, a miner at Never Sweat Mine, received serious injuries to his eyes from a blast, on August 4th.

Jerry Morrissey, a station tender at the Mountain Con., had his back broken by a runaway cage, on Aug. 12th. His partner, Joseph H. Duval, died of his injuries. Morrissey is at the Sister's Hospital and not expected to recover.

Edward M. Ryan, a pipeman at the Diamond Mine, on Aug. 15th leg broken by falling down a manway.

Emanuel Syron, a miner at the Green Mountain, on Nov. 9th had a leg broken by a cave of ground.

Dennis J. Shea, a miner employed at the Diamond Mine, on Nov. 29th had a leg broken by a cave of ground.

... MINES ...

SILVER BOW COUNTY.—THE ANACONDA GROUP.

The mines operated by the Anaconda Copper Mining Company during the year 1897 were the Anaconda, Never Sweat, St. Lawrence, No. 1, St. Lawrence, No. 2, High Ore, Bell, Green Mountain, Diamond, Mountain Consolidated, No. 1, Mountain Consolidated, No. 2, and Buffalo. Marcus Daly is General Manager. They are all copper properties, with silver and gold as by-products. The company maintains its own fire department under the direction of a fire chief. Safety appliances are on all the cages and are tested once a week or oftener. Finger boards are in place in all the mines. The engineers on the hoisting engines are employed on eight hour shifts at all the mines of the company. A total of 3057 men are employed underground and on the surface.

Mountain Con., No. 1, James Keegan is superintendent, William Tobin, Foreman. Mr. Keegan is also Superintendent of the Mountain Con. No. 2, Buffalo and Green Mountain, the first three mines employing 455 men underground, 76 topmen and 6 engineers. The main shaft of the Mountain Con. No. 1 has three compartments and is down 1400 feet. The shaft was developed 400 feet during 1897. The engine is a four cylinder, compound, built by the Union Iron Works of San Francisco. Its cylinders are 46x72 and 26 x 72. This engine is capable of hoisting four double-deck cages from a depth of 4000 feet. There are two four-deck cages in use. A flat steel rope, 1-2 x 8 inches is used. The main shaft is timbered with 12 x 12 and the stopes with 10 x 10 square sets. On the 500, 600, 700, 800, 900 and 1000 foot levels there are connections on the east side with the Green Mountain mine. On each level above the 1300 foot on the west side there are connections with the Mountain Con. No.2. Finger boards are on all levels pointing to places of exit. The ventilation is good and every precaution is taken and safeguard employed to protect the men from accident. The safety appliances are frequently tested. A duplex air compressor, having a capacity of supplying 90 drills is in constant use. There are two pumps for fire purposes on the surface, with ten 3 inch

fire plugs, four hose carts and 7000 feet of hose. Five city hydrants are also available in case of fire. The mine, underground, is also well supplied with fire extinguishers.

Mountain Con. No. 2, James Keegan, Superintendent; William Tobin, Foreman. The main shaft is down 1500 feet, of which 500 feet has been developed during 1897. The shaft has three compartments and is timbered with 12 x 12 and the stopes with 10 x 10 square sets. The hoisting is done with a 20 x 48, Webster, Camp and Lane engine. The rope is 1-2 x 6 inches, flat steel. The underground workings are connected at each level down to the 1300 foot level, with the Mountain Con. No. 1 shaft, and on the west there are connections down to the 1000 foot level, on each level, with the Buffalo. Finger boards are in all cross cuts.

The Buffalo. The main shaft is 1000 feet deep, of which 100 feet has been sunk during 1897. This shaft at present is used merely as an air shaft for the purpose of affording better ventilation for the Mountain Con. No. 1 and Mountain Con. No. 2, with which it is connected. The mine at present is being worked through the Mountain Con. No. 2 shaft.

The Green Mountain, James Keegan, Superintendent and James Brennan, Foreman. The mine employs 355 men underground and 45 topmen, also three engineers. The main shaft has three compartments and has a depth of 1600 feet. It was developed 200 feet during 1897. There are two cages of four decks each, connected with flat steel rope, 3-4 x 7 inches, to a Webster, Camp and Lane 30 x 72 engine. Safety appliances are in place and tested each week. The ventilation is good. Two Ingersoll-Sergeant, 24 x 48 air compressors, having a capacity of 35 drills each, are in constant operation. The mine is connected on the east side at the 1000 foot level with the Wake Up Jim, and on the west side, at the 800, 900, 1000, and 1100 foot levels, with the Mountain Con. No. 1. The powder magazine is at the 900 foot level, about 350 feet west of the shaft. There is a large supply of fire extinguishers on hand.

The Anaconda. John O'Neill is Superintendent and Dennis Kennedy, Foreman. Mr. O'Neil is also superintendent of the Never Sweat, St. Lawrence, No. 1, and St. Lawrence No. 2. This group of mines employs 1250 men underground, 250 men on the surface and 12 hoisting engineers. The main shaft of the Anaconda is 1400 feet deep and has three compartments. The hoisting shafts are 4 1-2 x 5 in the clear

and the pump shaft 7 x 5 feet. Two double deck cages are in use. The hoisting engine was manufactured by J. P. Morris, its dimensions being 20 x 60. The air compressor is of the Ingersoll-Sergeant build and has a capacity of 100 drills. Safety appliances are in place and are tested each week. The ventilation is J. P. Moris, its dimensions being 20 x 60. The air compressor is of the Ingersoll-Sergeant build and has a capacity of 100 drills. Safety appliances are in place and are tested each week. The ventilation is good. There are connections on the east side with the St. Lawrence No. 2 and on the west side down to the 1400 foot level with the Never Sweat. It is connected on the north of 1000 foot level with the Bell mine and there are also connections at each level on the east with the St. Lawrence, No. 1. There is ample equipment in the way of fire extinguishers and hose carts.

Never Sweat. Patrick Eagan is Foreman. The main shaft has three compartments and has a depth of 1400 feet. The hoisting engine is a vertical beam engine made by the Union Iron Works of San Francisco, its dimensions being 26 x 72 and 46 x 72. The rope is of flat steel, 1-2 x 8 inches. One four deck cage and one skip of 8 tons capacity are used at the mine. The skip is a self dumping arrangement and is used almost exclusively for hoisting ore, while the cage is used for hoisting men. The mine is connected on the east, at each level with the Anaconda. It is well ventilated and the safety appliances are tested each day.

St. Lawrence No. 1. Jerry McCarthy, Foreman. The main shaft has three compartments and is down 1400 feet, of which 200 feet were sunk during 1897. On the west it is connected at each level down to the 1200 with the Anaconda. There is a difference of 200 feet in the elevation of the two mines, the 1200 of the St. Lawrence being the 1400 foot level of the Anaconda. It is also connected with the St. Lawrence, No. 2, at the 100, 200, 600, 700 and 800 foot levels on the north. A Union Iron Works engine, 30 x 72, is used for hoisting, the rope being 1-2 x 7 inches. Safety appliances are tested each week. The pumps in the mine include one Duplex Knowles at the 900 foot level and a compound Riedler at the 1000 foot level. The air is good at all of the levels except in what is known as the "Fire district" from the 800 foot level to the surface. There are a number of fire pumps and an abundance of hose in case of fire. During the year 1897 a new hoisting engine, 30 x 72, was installed. It is the largest hoisting engine

in Montana. The first steel gallows frame in the State was also placed in position at this mine during the year. Its total height is 113 feet, but its base is 18 feet below the collar of the shaft making it 95 feet high from that point.

St. Lawrence, No. 2. The shaft has a depth of 800 feet and has three compartments. This is a new shaft in the district in which the fire occurred at the St. Lawrence mine a few years ago. It is equipped with a Dickinson engine, 18 x 48, attached to rope 1-2 x 5 inches. The ventilation of the mine is poor and the temperature very high. The workings are connected on the southwest at the 300, 400 and 800 foot levels with the St. Lawrence No. 1, and on the west, at the 400, 500, 600, 700 and 800 foot levels, with the Anaconda. Safety appliances are tested each week.

High Ore. William Skyrme, Foreman and Superintendent. This shaft is popularly known as the High Ore No. 2 shaft. It is one of the best shafts of the Anaconda Company and is, probably, intended to be the main working shaft of the Company's properties. At the present only development work is in progress and no ore is being extracted. It employs forty men underground, 24 topmen and 3 engineers. The main shaft has three compartments and is down 1600 feet. The shaft is timbered with 12 x 12 and the drifts with 10 x 10 square sets. Two single deck cages are in use. The rope is 3-4 x 4 inches, steel. The hoisting engine is a 24 x 48 Webster, Camp and Lane. Safety appliances are tested every week. An Ingersoll-Sergeant compressor supplies air to 15 drills. The fire equipment consists of 500 feet of hose with plugs and hose carts. There are two exits, one on the east side of the 1200 foot level, connecting with the Modoc.

The Diamond. James Higgins, Superintendent, John Quilty, Foreman. Mr. Higgins is also Superintendent and Mr. Quilty, Foreman of the Bell shaft, adjoining the Diamond. Both properties employ 480 men underground, 55 men on the surface and 6 hoisting engineers. The Diamond shaft is developed to a depth of 1200 feet of which 550 feet was developed during 1897. The shaft has two compartments. The shaft timbers are 12 x 12. In the stopes 10 x 10 square sets are used. The hoisting engine was built by J. P. Morris, its dimensions being 20 x 60. The rope is 1-2 x 5 1-2 inches. There are two double-deck cages, one cage being equipped with safety doors. Safety appliances are in place and are tested once each week. There are seven exits. On the east side of the shaft, at the 300, 800, 900, 1000, 1100 and 1200 foot

levels there are connections with the Bell workings. Finger boards are in place. The ventilation of the mine is good.

The Bell. This mine is under the same management as the Diamond. The main shaft has a depth of 1500 feet. The shaft has three compartments below the 900 foot level. Two double deck cages are in use. The hoisting engine in use was built by the Chicago Iron Works, its dimensions being 20 x 48. The rope is 1-2 by 5 inches. Safety appliances are tested twice each week. An Ingersoll-Sargeant cross, compound air compressor is in constant use. It has a capacity of 30 drills. The ventilation is good. There are ten exits in the mine, two on the west side of the 800 and 1200 foot levels, with the Grey Rock, and on the 300, 800, 900, 1000, 1100 and 1200 foot levels with the Diamond. There is also a connection on the east side, at the 1150 foot level, with the Anaconda.

Note—The Bell ledge crosses the shaft at the 900 foot level. A talc seam clings to the hanging wall and when cut the ground surrounding it swells to such an extent that a series of retaining or false sets have to be placed about 18 inches back from the regular shaft sets to keep the latter in place. These retaining sets are of the same dimensions as the shaft sets and require a large force of men to keep them in position, or as it is known in mining parlance, "easing up." It is considered the hardest shaft in the State to keep in place and requires much skill and experience in keeping it in good condition. Under the present management, it may be added, the shaft is kept in perfect control.

THE WASHOE GROUP.

The mines operated by the Washoe Mining Co., during the year 1897, were the Moonlight and Poulin. Charles F. Booth is the General Manager of the Company.

The Moonlight. John O'Meara, Superintendent and Foreman. Thirty men are employed underground, also six topmen and three engineers. This is a newly developed property and no stoping has been done. The main shaft is 910 feet in depth, 310 feet having been sunk in 1897. The shaft has three compartments and is timbered with 10 x 10. The character of the ore is copper-silver. A Dickson 20 x 60 engine is used for hoisting purposes with a rope 1-2 x 6 inches. Safety appliances are in place and are tested once each month. There are two

exits, one being a connection on the 750 foot level, 30 feet east of the main cross cut, with a raise of 25 feet to the Never Sweat 1000 foot level. One Ingersoll-Sergeant compressor, capacity 12 drills, is in use. There is a fire pump and 250 feet of hose. The ventilation is good.

The Poulin. J. T. Bolger, Superintendent and Foreman. Forty-five miners are employed underground, and 15 topmen and 3 engineers. The main shaft has three compartments and is 1200 feet in depth, 100 feet having been sunk in 1897. The character of the ore is copper-silver. Two single deck cages are used and a round one inch rope. The engine is of the Dickson make, its dimensions being 14 x 20. Safety appliances are tested twice a month. There are four exits. There is a connection on the east side about 475 feet from the main shaft on the 300, 400 and 600 foot levels with the Stella. There are two compound, duplex Knowles station pumps at the 600 and 1200 foot levels, having each a capacity of 500 gallons per minute. The shaft is in fine condition. No ore is being extracted, the development of the mine having been in progress during the year.

BOSTON AND MONTANA.

The mines of the Boston and Montana Consolidated Copper and Silver Mining Co., in operation during the year 1897, were the Mountain View, Pennsylvania, Leonard, East and West Coulsas and the Atlantic. The Anderson is also worked under lease and bond. They are all copper properties with silver and gold as by-products. A total of 685 men are employed at the mines of this company. Frank Klepetko is General Manager and C. S. Batterman, Superintendent.

Mountain View. R. H. Dawe, Foreman. This mine employs 165 men underground; 19 topmen and 3 engineers. The main shaft has three compartments and is 1200 feet deep. The shaft timbers are 12 x 12 and in the stopes 10 x 10 square sets are used. Electric call bells are in use in the mine. There are two double deck cages with safety doors. The hoisting engine was built by E. P. Allis & Co., its dimensions being 18 x 48. The rope is 3-8 x 5 inches. There are nine exits in the mine. There is what is known as the north and south leads, about 500 feet apart. The air shaft is about 500 feet from the main shaft and connects each level down to the 600 foot level on the south side. There are also connections on the north lead with the West Co-

lusa on the 600, 700 and 800 foot levels, about a thousand feet east of the main shaft. On the same lead, at the 900 and 1000 foot levels, there are connections with the Leonard shaft, about 1000 feet east of main shaft. The connection with the West Colusa are about 30 feet up from the main levels, and the connections with the Leonard, one set below the levels on the 900 and 1000. There are also connections with the Rarus on the east at the 700 and 900 foot levels, about 1200 feet east of main shaft. Sinking is in progress at the present time. The ventilation is good and safety appliances are in place and are tested once a week.

Pennsylvania. B. H. Dunshee, Foreman. Employs 95 men underground, 12 topmen and 3 engineers. The main shaft is down 800 feet, 100 feet having been sunk in 1897. The shaft has three compartments. The hoisting engine is of the E. P. Allis build, 19 x 48. The rope is 5-8 x 5 inches. Two double deck cages are in use. Two safety doors are on one cage, which is used almost exclusively for hoisting men. The timber used in the shaft are 12 x 12 and in the stopes 10 x 10 square sets. Electric call bells are used at stations. The powder houses are located on the 200 foot and 500 foot levels, about 500 feet west of the main shaft. There is a new pump, having a capacity of 400 gallons per minute on the 600 foot level. The workings are connected east of the main shaft with the Silver Bow, No. 1, on the 200 and 600 foot levels. Finger boards are in place on all levels. The mine is worked in a very thorough manner and the ventilation is excellent. Safety appliances are in place and are tested once a week. An Ingersoll-Sargeant compressor of 10 drill capacity, is in constant operation. Sinking was in progress at the date of inspection.

The Leonard. John H. Miles, Foreman. Employs 159 men underground, 88 topmen and three engineers. The main shaft has three compartments, and is down 800 feet. An E. P. Allis, 20 x 60 engine is in use with two double deck cages with safety doors. The rope is 1-2 x 5 inches. Safety appliances are in place and are tested once each week. Electric call bells are in each level. The mine is timbered with square sets. There are eleven exits. There are connections on the west side, 1400 feet from the main shaft, with the Mountain View on the 100, 200, 300, 400, 500 and 600 foot levels, and on the east side, about 600 feet from main shaft, with the East Colusa, on the 400 and 500 foot levels. It is connected also on the west side of the 700 foot level with the West Colusa, about 700 feet from Main shaft. The Leonard

shaft is about 500 feet lower than the Mountain View, on a level with the East Colusa and about 100 feet lower than the West Colusa. Finger boards are on every turn at each level. There is one Risdon air compressor in use with a capacity of 14 drills. The powder house is on the 500 foot level. There is a Riedler station pump at the 600 foot level. The shaft house is well protected in case of fire, the equipment consisting of 4 city hydrants, one fire pump and 1600 feet of hose.

East Colusa. John H. Miles, Foreman, employs 35 men underground, 5 topmen and 3 engineers. The shaft has two compartments and is 800 feet in depth. Flash lights are used for call bells. The mine is timbered with 10 x 10 and 8 x 8 square sets. One single deck cage is used with a 7-8 inch round rope. The engine is an 8 x 10, Ledgerwood. Safety appliances are in place and are tested once each week. Finger boards are in each turn of the mine. There are seven exits. On the north side there are connections with the Leonard on the 200 and 400 foot levels, about 40 feet from the main shaft. There is also an air shaft about 400 feet north of main shaft connected with the 200 and 400 foot levels: On the 500 foot level there are also connections about 700 feet from the main shaft on the north side with the Leonard. There are also connections about 700 feet from the main shaft on the west side of the 400 foot level, with the West Colusa. There is a fire pump and 600 feet of hose at surface.

West Colusa. John H. Miles, Foreman. Employs 37 men underground, 35 topmen and 3 engineers. The main shaft is 720 feet deep, 120 feet having been sunk in 1897, and sinking was in progress at date of inspection. The shaft has three compartments and is the largest in size in Montana, being 9 feet by 17 feet 8 inches in the clear. This shaft is intended for double deck cages so that two cars can be placed endways on each cage. Mules will be used underground when work is resumed at this mine, and the great size of the cages will enable them to be lowered and hoisted every day. The pump shaft will be 9 x 5 in the clear and the two working shafts will be 9 ft. x 5 ft. 4 inches each. The pump shaft will be used for sinking purposes and through it the shaft can be developed to a greater depth without interfering with the operations at the mine. The timbers used for end pieces are 12 x 14 and the wall plates are 12 x 12. Electric call bells are used. The stopes are timbered with 10 x 10 square sets. Development work only is in progress and will be continued until the shaft has attained a depth of 1400 feet. At present only a single deck cage with a round inch

rope is in use. The engine used is a Nordberg, 20 x 60. Safety appliances are in place and are tested once each week. Finger boards are at every turn in the mine. There are six exits. On the west side the workings are connected at the 200, 300 and 400 foot levels with the Mountain View. On the east side there are connections at the 600 foot level with the Leonard, and also on the same side at the 300 foot level, about 700 feet from main shaft, with the East Colusa. There is a fire pump and 600 feet of hose at surface.

Atlantic. John H. Miles, Foreman. This is a newly developed shaft and, at present, only a diamond drill is in operation for exploring purposes. Two men are employed underground and two engineers. The main shaft is down 800 feet, of which 200 feet was sunk in 1897. It has three compartments, timbered with 10 x 10s. One single deck cage, with a round 7-8 inch steel rope and a 10 x 12 Iron Bay engine are used. Safety appliances are tested frequently. There is only one exit. There is a fire pump and 300 feet of hose at surface.

Anderson. This mine was leased and bonded by the B. & M. C. C. & Sm. Co., during the year. John Johnson is foreman. The shaft is 297 feet deep, of which 100 feet was developed during 1897. It has two compartments. The mine employs 12 men underground and 2 on top, and two engineers. The shaft is timbered with 10 x 10 and the stopes with 8 x 8 square sets. The character of the ore is copper-silver. A 10 x 12, Ledgerwood engine and 3-4 inch steel rope are used. There is only one exit. Only development work was in progress when inspected. The shaft house is located 40 feet from the main shaft.

BUTTE AND BOSTON.

The mines operated by the Butte and Boston Mining Company during the year 1897, were the Silver Bow, No. 1, Silver Bow No. 3 (Harrington Placer), East and West Gray Rock, and Blue Jay. Frank Klepetko is General Manager, and C. S. Batterman, Superintendent. The character of the ore obtained from the above mines is copper-silver. About 198 men are employed.

Silver Bow, No. 1. W. E. Kane, Foreman. The main shaft is 1000 feet deep and has three compartments. Two single deck cages and 3-8 x 4 inch steel rope are used. Hoisting is done with a 16 x 42, E.

P. Allis engine. A Riedler pump at the 1000 foot station has a capacity of 900 gallons of water per minute. At the 500 there is a Palmer Station pump, having a capacity of 1230 gals. per minute. The breasts and stopes are timbered with 10 x 10 square sets and in some of the stopes half sets are used. This mine employs 45 men underground, 7 topmen and 3 engineers. There are seven exits. There is an upraise to surface about 190 feet from main shaft, connecting with each level to the 1000. There are connections with the Silver Bow, No. 2, on the 700 level about 800 feet east of main shaft. There is another on the 400 about 400 feet east of Main shaft with Silver Bow No. 2. There is a connection on the west, about 1300 feet from the main shaft, with the Pennsylvania, on the 100 and 400 foot levels. Finger boards are at all crosscuts and manways leading to each exit. Electric call bells are on each level. The ventilation is good and the mine is being worked in a thorough manner. At this date, (Oct. 1897), a winze is being sunk on the ledge from the 1000 foot level for prospecting purposes.

Silver Bow, No. 3. W. E. Kane, Foreman. Employs 12 men underground, 2 topmen and 2 engineers. The main shaft is down 275 feet, all of which has been sunk this year. It has two compartments. The mine is timbered with 10 x 10 tunnel sets. The ore is copper-silver. Two single deck cages are in use and a round one inch rope. The hoisting engine is a 10 x 12, Fraser and Chalmers. Safety appliances are in place and are tested once a month. There is but one exit, the main shaft. The air is good owing to the large amount of water. This shaft is sunk on the Harrington Placer, and the only work in progress is cross-cutting and drifting.

East Gray Rock. Wm. Williams, Foreman. Employs 38 men underground, 6 topmen and 3 engineers. The main shaft is down 1400 feet, has three compartments and is timbered with 10 x 10. Mine is timbered with square sets and stulls. There are two double deck cages. Safety appliances are in place and tested frequently. There is a 20 x 48, Chicago Iron Works engine and a rope 1-2 x 5 inches. The character of the ore is copper-silver. There are four exits. There are two connections on the east with the Bell mine, one on the 700 and the other on the 1000 foot level. There is also connection on the west side of the 300 foot level with the Penrose shaft and also a connection on the west side, at the 400 foot level with the West Gray Rock. The ventilation is good.

West Gray Rock. Wm. Williams, Foreman. Employs 35 men un-

derground, 2 topmen and 3 engineers. The main shaft is 700 feet deep and has two compartments. The mine is timbered with square sets. The character of the ore is copper-silver. One single deck cage is used. A Pacific Iron Works engine 8 x 12, with a round one inch steel rope is used for hoisting. Safety appliances are in use and tested once each week. There are three exits. There is a connection on the east of the 200 foot level with an air shaft 250 feet from the main shaft and also one on the 400 foot level with the East Gray Rock. The ventilation is good.

Blue Jay. B. H. Dunshee, Foreman. Employes 25 men underground, 12 topmen and 3 engineers. The main shaft is 875 feet deep and was sunk this year. Sinking was also in progress at the date of inspection. (Oct. 1897). The shaft is on an incline of 75 degrees. It has two compartments down to 600 foot level and three compartments from there down. Electric call bells are at all levels. The character of the ore is copper-silver. The mine is well timbered with 10 x 10 square sets. One single deck cage, made to conform to the inclined shaft, is in use. Safety appliances are in use and are tested each week. An Ottumwa, 10 x 12, engine and a round 3-4 inch steel rope are in use. There are two exits, one being the old working shaft, about 50 feet east of the present shaft, and now used as an air shaft. It is connected with every level down to the 600. The ventilation is good.

W. A. CLARK'S MINES.

The mines operated by W. A. Clark during the year 1897 were the Colusa-Parrot, Original and Stewart. W. A. Clark is owner and Charles W. Clark, is Superintendent and Manager.

Colusa-Parrot. Thomas S. Kilgallon, Foreman. Employs 104 men underground, 18 topmen and 3 engineers. The main shaft is 1150 feet deep, of which 100 feet was sunk during 1897. The shaft has three compartments down to 300 foot level and two compartments from that level down. 10 x 10 and 8 x 8 square sets are used. The character of the ore is copper-silver. One double deck cage with safety doors is used. The engine is a 16 x 30, Montana Iron Works, Corliss and the rope is 5-1-8 x 4 1-2 inches. There are two exits. There is an air shaft 50 feet northeast of main shaft and is well supplied with ladders in case of accident. The air shaft connects with each level down

to the 300 foot level. This air shaft is connected with the lower workings by upraises.

Original. Thomas Bryant, Foreman. The shaft is down 1000 feet, 200 feet of which was sunk in 1897. The shaft is on an incline of 70 degrees and has two compartments, timbered with 10 x 10. Character of ore is silver-copper. Twenty men are employed underground, 6 topmen and 3 engineers. A skip and cage are used in shaft, the skip for hoisting ore and the cage for hoisting men. The cage is a double deck built to conform to the incline shaft. The engine used for hoisting is an 18 x 36 E. P. Allis with one inch round steel rope. Safety appliances are in place and are tested every two weeks. There are three exits. One is on the east side of the 200 foot level connecting with an air shaft about 200 feet from main shaft, and one on the west side of the 200 about 100 feet from the main shaft also connects with the air shaft. The ventilation is good. In case of fire there is a large amount of hose to connect with city hydrants. One Rand air compressor in use at this mine is of 10 drill capacity.

The Stewart. Thomas Bryant, Foreman. Six men are employed underground, 3 on top and 2 engineers. After a shut down of several months, operations were resumed at the mine during October, 1897. The main shaft is down 600 feet. The character of the ore is copper-silver. The hoisting is done with a skip. The engine is a 10 x 10, Ledgerwood. There are two exits, one from the 400 foot level connects about 250 feet south of main shaft with an air shaft.

COLORADO MINING AND SMELTING CO.

The mines operated by the Colorado Mining and Smelting Co. during the year 1897, were the Gagnon, Nettie No. 1, 2 and 3, and the Old Glory and Combination under lease and bond. Work on the latter properties was suspended, however, during the fall months. Henry Williams is General Manager. C. W. Goodale has full charge of mining operations and John Hewitt is Superintendent.

Gagnon. John Pond is Foreman. This mine employs 175 men underground, 32 topmen and 3 engineers on hoist. The main shaft is on an incline of 74 degrees and is down 1525 feet. Sinking is in progress at the date of the compiling of this report. The shaft has three compartments and the mine is timbered with 10 x 10 square sets and

half sets. The hoisting is done with a 22 x 48 engine, (Dixon), attached to a 1 1/8 inch round steel rope. Two skips are used. Safety appliances are tested each week. The character of the ore is copper-silver. There is an air shaft about 400 feet west of main shaft that connects each level down to the 1500. This shaft is equipped with danger signals, consisting of electric lamps at the levels which are never used except in case of danger. When the lights are turned on it is a warning to the men that danger exists in some portion of the mine and a signal to go to the surface at once. In the event of a fire at the surface the engineer turns a switch which throws on the lights for the 1500 feet in the air shaft. The ventilation is good. Electric call bells are also in use at each level. The powder house is located at the 500 foot level. A system of ventilation, known as water blasts, is used at the 1000 foot level for the purpose of utilizing the mine water in forcing air into the workings. Finger boards are at every turn in the mine. Fire extinguishers are on each station and in case of fire on any level there is an abundance of fire hose with fire pumps on the surface. Everything around the mine is in excellent condition and every precaution is taken against accident in all departments.

Nettie, No. 1. Joseph Reynolds, Foreman. This mine employs 5 men underground and 1 engineer. The main shaft is down 300 feet and has two compartments. A Griffith and Wedge, 10 x 14, engine is used for hoisting, with a single deck cage equipped with safety doors. Safety appliances are tested each week. Around 7-8 inch rope is used. The character of the ore is silver and gold. There are three exits. There is a connection on the 300 foot level with the Nettie, No. 2, on the west and another on the east on the same level with the Nettie, No. 3. The ventilation is good. Finger boards are in place. The mine is timbered with stulls and square sets.

Nettie, No. 2. Jos. Reynolds, Foreman. This mine employs 12 men underground and two hoisting engineers. The shaft is on an incline of 35 degrees and is down 450 feet. A Ledgerwood, 8 x 10 engine is used for hoisting with a 5-8 inch, round steel rope. The main shaft has two compartments. The character of the ore is silver-gold. Finger boards are in place. There are three exits. One on the 300 foot level connects with the Nettie, No. 1 on the east. There is also one on the 450 foot level that connects with the Nettie, No. 3 on the east, about 700 feet from the main shaft. Ventilation is good.

Nettie, No. 3. Joseph Reynolds is Foreman. This mine employs

60 men underground, 6 men on top and 3 engineers. The main shaft has two compartments and is down 540 feet. It is timbered with 10 x 10 and the stopes are timbered with half sets and stulls. The character of the ore is silver and gold. The engine is a Hendy & Myers, 8 x 16, with a round one inch rope. A single deck cage is used with safety doors, this mine being the first in the county to use safety doors. Safety appliances are in place and are tested once every two weeks. Finger boards are in each turn in the mine. There are three exits, two on the west side connecting with the Nettie, No. 1, and Nettie, No. 2. The ventilation is good.

Old Glory. This mine was worked under lease and bond by the Colorado M. & S. Co. It is owned by Leggat, Dwyer & Co. John Hewitt was Foreman. Fifteen men were employed underground, two men on top and two engineers. The main shaft is down 500 feet and has two compartments. It has 600 feet of drift timbered with 10 x 10 square sets. The ore is copper-silver. A Griffith & Wedge, 7 1-2 x 10 engine is used for hoisting. A round, steel rope 7-8 inch with a single deck cage are used. Safety doors are in place. Safety appliances are tested once each month. There is only one exit. The shaft house is back 57 feet from the shaft. There is a winze down 200 feet on the 500 foot level in which an electric hoist is used. The ventilation is fair. This mine is located in Centerville.

Combination. This mine is owned by J. P. Raines and is located in Meaderville. Was worked by the Colorado Co. in 1897. J. A. McDonald, Foreman. Employs 12 men underground, 2 topmen and 2 engineers. The main shaft has two compartments and is down 410 feet, all of which has been sunk in 1897. There is a single deck cage with safety doors and safety appliances which are tested once each week. The engine is a 12 x 14 Risdon Iron Works, with a round one inch rope. The character of the ore is copper-silver. There is only one exit. The shaft house is located 40 feet back from main shaft. The ventilation is good. Square sets, 10 x 10 are used.

MONTANA ORE PURCHASING CO.

The mines operated by the Montana Ore Purchasing Co. during the year 1897 were the Rarus, No. 1 and No. 2, and Glengary, and those under lease and bond by the same company were the Nipper, Henry

George and Westlake. John McGinnis is General Manager and C. S. McHenry, Superintendent.

The Rarus. This mine employs 145 men underground, 40 topmen and 5 hoisting engineers. This property is worked through two shafts known as No. 1 and No. 2. Shaft No. 1 is down 800 feet and has two compartments down to 600 foot level and three from that down. No. 2 shaft is down 900 feet of which 300 feet has been sunk in 1897, and has three compartments. An Ottumwa, 10 x 12 engine is used with a 7-8 inch round rope and a single deck cage with safety doors. At No. 1 shaft there is a Webster, Camp & Lane engine, 20 x 48, a flat steel rope, 3-8 x 6 inches, and one double deck cage with safety doors. Nearly all the hoisting is done through No. 1 shaft at the present time. The distance between the two shafts is 180 feet, and they are connected at each level except the 500, down to the 800 foot level. The powder house is at the 300 level. No work is being done above the 450 foot level. There are six exits. There is a connection with the Mountain View 900 foot level on the west of the 700 foot level, about 1000 feet west of shaft No. 1. There is another connection on the east side about 350 feet from No. 2 shaft with the Snohomish on the 450, 500 and 600 foot levels. Finger boards are in every turn in the mine and every portion of the workings is well supplied with good air. There is an Ingersoll-Sargeant air compressor of 20 drill capacity. The mine is timbered with 10 x 10 square and half sets. Safety appliances are in place and are tested twice each week. A pump and a large quantity of hose are on hand in case of fire. A system of electric flash light call bells, the invention of Superintendent McHenry, are in use at the mine, it being the first mine in the State so equipped.

Glengary. L. J. Fisher, Foreman. Employs 16 men underground, 4 topmen and 3 engineers. The shaft is 800 feet deep, but is only worked to the 200 foot level. It has two compartments to the 400 foot level and from there down three. There are no stations cut at the 500 and 700, leaving only 6 stations in the mine. The engine is a 9 x 15 Pacific Iron Works with a 7-8 inch round steel rope and a single deck cage. There are three exits. There is a connection east of the 200 foot level with the Silver Bow No. 3, on the west of the 200 foot level there is a connection with the Ground Squirrel. This makes the ventilation good. Safety appliances are in place and tested once each week. Finger boards are at all turns. The ore is copper-silver. The mine is timbered with square sets and stulls.

The Nipper. John Kane is Foreman. Eight men are employed underground, 2 men on top and 2 engineers. The shaft is down 500 feet of which 250 feet was sunk in 1897. The shaft has two compartments. There is an Ottumwa engine, 8 x 10, a round 3-4 inch rope and one single deck cage with safety appliances that are tested every two weeks. The ore is copper-silver. The mine is timbered with 10 x 10 square sets. There is only one exit. The shaft house is back from the shaft 50 feet. Ventilation is fair. This is a new shaft and only cross-cutting has been done.

Henry George. Leased by M. O. P. Co. McHenry is in charge of operations. Employs 6 men underground, 1 topman and 2 engineers. The shaft is down 200 feet of which 80 feet has been sunk this year. It has two compartments and is timbered with 10 x 10. The ore is copper-silver. A 9 x 12 engine is used for hoisting, with a 7-8 inch rope. There is but one exit. The ventilation is good. The shaft house is back from shaft 45 feet. A bucket is used with a cross-head. The property is owned by Messrs. Booth, Mahoney and Warren.

Westlake. Leased by M. O. P. Co. Owned by W. A. Westlake. C. S. McHenry is in charge. Employs 14 men underground, 2 topmen and 2 engineers. The main shaft is 250 feet deep of which 165 feet has been sunk this year. It has two compartments and is timbered with 8 x 8 and the stopes with stulls. The ore is copper-silver. A Ledgerwood 7 x 7 engine and 5-8 inch round steel rope are used with a bucket. There is only one exit. The shaft house stands 55 feet from the main shaft. The ventilation is fair.

THE PARROT.

The Parrot C. & S. Mining Co. operated two mines during 1897, viz., Parrot and Little Minah. R. D. Grant is general Manager and Ben Tibby, Superintendent. Matt Hodge is Foreman.

The Parrot. Employs 195 men underground, 30 topmen and 3 engineers. The main shaft is down 1122 feet and has three compartments from the surface to the 400 foot level. From the latter level to the bottom it has four compartments. The mine is timbered with 10 x 10 and 8 x 8 square sets. Two double deck cages with removable safety doors are in use. The hoisting engine was made by Fraser and Chalmers and is 20 x 60. The rope is 3-8 x 5 1-2 inches, steel. Electric call bells are on

each level. There are two air shafts, one on the east end about 150 feet from the main shaft and one on the south west end about 175 feet from shaft. Finger boards are in place. Safety appliances are tested once each week. There is a compound duplex pump at 1100 foot level having a capacity of 500 gals. per minute. There is a fire pump, hose cart and 1500 feet of hose. The system of ventilation at the Parrot deserves especial mention. The mine may be said to be a model one in every respect and its ventilation could not be improved upon. The air at the lowest level is as pure as on the upper levels.

The Little Minah. This mine is also owned and operated by the Parrot Co. John R. Evans is Foreman. Employs 20 men underground, 5 topmen and 3 engineers. The shaft is down 400 feet and sinking is in progress. It has two compartments. The mine is timbered with 10 x 10 square sets. Ore is copper-silver. A 12 x 36 engine, of peculiar construction is in use with a single deck cage and a round one inch rope. Safety appliances are in place and are tested once each week. There are two exits. There is an air shaft 30 feet east of main shaft that connects with 50 foot level. Ventilation is very good.

THE ALICE.

The mines operated by the Alice Gold and Silver Mining Co. during the year were the Alice, Magna Charta and Blue Wing. T. W. Buzzo is Superintendent and Manager. John Rich is Foreman of all the properties.

The Alice. This mine employs 15 men underground, 2 topmen and 3 engineers. The main shaft is 1500 feet in depth, but is only worked to the 1000 foot level, and has three compartments. It is timbered with square sets and stulls. The ore is silver and gold. There are two single deck cages with safety doors and a flat steel rope 1-2 x 4 1-2 inches. A Fraser & Chalmers 18 x 48 engine is used for hoisting. Safety appliances are in place and are tested once every two weeks. Electric call bells are used. Finger boards are in each turn. There are four exits. There is a connection to surface with air shaft about 150 feet east of main shaft. There is another connection to surface about 250 feet west of main shaft. These connect each and every level. There is also a connection on the 100 foot level with the Moulton about 680

feet west of the main shaft. Ventilation is good. There is 1500 feet of hose with fire plugs and hose cart on surface. The powder house is on the 700 foot level. A Cornish pump operated by a 22 x 60 Fraser & Chalmers engine having a capacity of 47 gallons to the stroke is in use. There is a Griffith and Wedge engine for furnishing electricity to the mine.

The Magna Charta. This mine is also located at Walkerville and is owned and operated by the same company. Employs 50 men underground, 6 topmen and 1 engineer. The main shaft is 700 feet deep and has three compartments. It is timbered with square sets and stull. Call bells are at each station. The ore is silver and gold. Two single deck cages are in use. A round 1 1-2 inch steel rope and a Griffith & Wedge 12 x 16 engine are used. Safety doors are on the cages and safety appliances are tested once each two weeks. There are three exits. There is a tunnel on the west side connecting with the 100 foot level; on the east side there is an air shaft that connects with the same level about 800 feet east of main shaft. Finger boards are in place and ventilation is good.

The Blue Wing. This mine is also owned and operated by the same company. Employs 50 men underground, 4 topmen and 3 engineers. The main shaft is 650 feet, two compartment. The mine is timbered with square sets and stulls. The ore is silver and gold. One single cage with safety doors is used with a round rope, one inch. A Griffith & Wedge 11 x 14 engine is used for hoisting. Safety appliances are in place and are tested once each two weeks. There are three exits. There is an air shaft on the west about 75 feet from main shaft connecting each level down to 500 foot level. There is also an air shaft about 125 feet east of main shaft that connects down to the 200 level. The ventilation is good. There are finger boards at every turn in the mine. There are three hydrants with hose attachments on the surface in case of fire. The powder house is on the 300 foot level about 125 feet north of main shaft.

MISCELLANEOUS MINES.

The Original, No. 6. This mine is also known as the Parrot, No. 6. It is owned by the Parrot Copper Co., but it is worked under lease by W. G. Benham, who is General Manager. Cyrus Bell is Foreman. 25

men are employed underground, 3 topmen and 3 engineers. The main shaft is 250 feet deep of which 100 feet was sunk in 1897. The shaft is on an incline of about 45 degrees for the last 200 feet and has two compartments. It is timbered with 8 x 8 square sets and the stopes with half sets. The character of the ore is copper-silver. A 50 H. P. electric engine is used for hoisting purposes. A bucket attached to 3-4 inch round rope is used. There are three exits. There is one connection on the west about 100 feet from main shaft at the 100 foot level with the air shaft to surface. There is another connection at the 100 foot level with the Original No. 5 on the west about 300 feet from the main shaft. Finger boards are in place at every turn in the mine.

The Ramsdell Parrot. This mine is owned by the Anaconda Copper Mining Co., and is operated under lease by Miles Finlen, who is Superintendent and Manager. Edward C. Sheehan is Foreman. 40 men underground, 4 topmen and 3 engineers are employed. The main shaft is 600 feet deep, has three compartments and is timbered with 10 x 10. The stopes are timbered with 8 x 8. The character of the ore is copper-silver. A Dickson 16 x 24 engine is used with a flat steel, 7-8 x 4 inch rope. One single deck cage is in use. It is equipped with safety doors. Safety appliances are in place and are tested once each week. There are two exits. There is a connection with the Little Anaconda on the 300 foot level about 350 feet east of main shaft. The ventilation is good.

J. I. C. Mine. This property is located in the Ground Squirrel District, south of the Pennsylvania, is owned by the Anaconda Copper Co. and is operated by Martin Elliott under lease. Mr. Elliott is General Manager and Superintendent. John Hennessy is Foreman. The mine employs 16 men underground, 1 topman and two engineers. The main shaft is down 600 feet and has three compartments. The mine is timbered with square and half sets. The character of the ore is copper-silver. The engine is an Ottumwa 10 x 12. A round 7-8 inch rope is used with one single deck cage. Safety appliances are in place and are tested once each month. There are three exits. There is a connection at the 200 foot level with the Ground Squirrel about 300 feet from the main shaft, and one on the west side of the same level with an air shaft about 150 feet west of the main shaft. The ventilation is good. Finger boards are in proper places in the mine.

The Speculator. This mine is owned and operated by P. A. Largey,

who is Manager and Superintendent. J. F. Case is Foreman. Underground 30 men are employed, 5 topmen and 3 engineers. The shaft is 700 feet deep, on an incline of 70 degrees and has two compartments. The mine is timbered with square sets and stulls. The character of the ore is copper-silver. A skip is used. Safety appliances are tested each week. The engine is a Webster, Camp and Lane 10 x 12. The rope is one inch round steel. There are two exits. An air shaft connects with each level about 150 feet east of main shaft. The ventilation is good. Finger boards are in position.

Chambers Mine. This property in the Ground Squirrel district is owned by J. J. Chambers and is operated under lease by W. B. Hamilton, who is General Manager and Superintendent. John Gillis is Foreman. The mine employs 10 men underground, 1 topman and 2 engineers. The main shaft is down 295 feet of which 50 feet has been sunk this year. It has two compartments. The mine is well timbered with 10 x 10 square sets. The ore is copper-silver. A Montana Iron Works engine 10 x 12 is used for hoisting. A round 3-4 inch rope is used and a bucket. No work is being done below the 200 foot level at the present time. There is but one exit. The ventilation is good. The shaft house is located 35 feet from the main shaft.

Grant Extension. This mine is owned by the Anaconda Copper Mining Co., and is operated under lease by Messrs. Swett & Metcalf. E. H. Metcalf, is General Manager, Superintendent and Foreman. The mine employs 14 men underground, 1 topman and two engineers. The main shaft is down 300 feet, all of which was sunk in 1897. The shaft has two compartments. The mine is timbered with square sets and stulls. The ore is copper-silver. An 8 1-2 x 10 Ottumwa engine with a single deck cage and 3-4 inch round rope are used. Safety appliances are tested once a month. There is but one exit. The shaft house is located 35 feet from the main shaft. The ventilation is fair.

Minnie Healy. This mine is owned by Devlin & Kelly and was operated during 1897 by Miles Finlen who was General Manager, under lease. Pat O'Neil was foreman. The mine employed 9 men underground, 2 topmen and two engineers. The main shaft is down 600 feet of which 400 feet was sunk in 1897. The shaft has two compartments. The ore is copper-silver. An Ottumwa 10 x 16 engine, with a single deck cage and a 7-8 inch round rope, are used. Safeties tested once a week. There is only one exit. The ventilation is good. The shaft house is located 35 feet from the main shaft.

The Snohomish. This mine is owned in part by the Butte & Boston, and is operated under lease by Messrs. Lynch, Gillie & Co. John Gillie is Manager, Geo. Casey, Superintendent, and Edward Finnegan, Foreman. 49 men are employed underground, 4 topmen and 3 engineers. The main shaft is down 400 feet, of which 50 feet was sunk in 1897. It has two compartments. The mine is timbered with 10 x 10 square sets and stulls. The ore is copper-silver. There is one single deck cage with safety doors. The safety appliances are tested each week. The engine is a 10 x 12 Ledgerwood with a 7-8 inch round rope. There are three exits. There are two connections on the east side of the 300 and 350 foot levels with the Rarus mine about 650 feet from the main shaft. The 350 foot level of the Snohomish connects with the 600 level of the Rarus. Ventilation is good. Finger boards are in place.

The Ella. This mine is located at Meaderville and is owned and operated by John R. Bordeaux & Co. Charles Bell is Foreman. Employs 14 men underground, 2 topmen and 2 engineers. The shaft is down 250 feet which has been sunk during 1897. It has two compartments. The shaft is timbered with 8 x 8. A cage with a round 7-8 inch rope and a Utah & Montana Iron Works, 8 x 10 engine are used. Safeties are tested once a month. There is but one exit. The shaft house is located 40 feet from the shaft. Ventilation is fair. The ore is copper and silver. On November 17th, I notified the owners of the mine, through the Foreman, Chas. Bell, that the shaft timbering was unsafe and that the defect would have to be remedied before work could proceed.

The Alex. Scott. This mine is located at Meaderville. It is owned by Jas. A. Murray, and is operated by R. J. Watson. The main shaft has two compartments and is 580 feet deep. Two hundred feet has been sunk this year. 10 men are employed underground and 2 engineers. A Ledgerwood, 12 x 16, engine, with a single cage and a round 7-8 inch rope are used. Safety appliances are tested every two weeks. There is but one exit. Ventilation is good. The shaft house is 40 feet from shaft. Ore is copper.

The Deadman. This mine is owned by the Anaconda Co., and is worked under lease by M. A. Hickey & Co. Wm. Dwyer is Foreman. The main shaft is 250 feet deep and has two compartments. 100 feet was sunk this year. 6 men are employed underground and 2 engineers. An Ottumwa 7 x 10 engine, a round 7-8 inch rope and bucket and cross-

head are used. Only development work is in progress. The ventilation is good. The shaft house is located 50 feet from the shaft. The ore is copper-silver.

The Lexington. This mine is located at Walkerville and is owned by the Societe Anonyme des Mines Lexington, of Paris, France. C. C. Rueger is Manager and Superintendent and J. D. Vachieri, Foreman. Employs 14 men underground and 1 engineer. The shaft is 1465 feet deep with three compartments. There is no work being done below the 500 foot level. The shaft is timbered with square sets and the mine with square timbers and stulls. The ore is silver-gold. A Fraser & Chalmers, 12 x 16 engine is used for hoisting with a flat steel rope 1-2 x 4 1-2 inches. There are 8 exits. There is a connection on the west end of the 500 foot level with the Wappello, 1300 feet from the main shaft. There is also a raise from this point to the 400 foot level. There is also a raise from the 300 foot level to the surface about 1400 feet west of main shaft. There is also a raise on the 200 foot level east about 700 feet from main shaft, another on the west to the surface on the same level about 1300 feet from main shaft. The powder house is on the west end of the 200 foot level about 80 feet from main cross-cut. Safety doors are on cages and are made of sheet iron. Safety appliances are tested once each month. Ventilation is good.

The Belle of Butte. This mine is located in Centerville and is owned by the Butte & Boston Mining Co., and is operated under lease by A. G. McIntire. The main shaft is down 200 feet and has two compartments. Mine is timbered with square sets and stulls. The ore is silver, lead and gold. Employs 10 men underground and 1 topman. Mr. McIntyre is Foreman and General Manager. A Buffalo whim attached to a 7-8 inch round rope is used for hoisting. There are two exits. There is an air shaft about 250 feet northeast of main shaft. Ventilation is good.

The Only Chance. This mine is located at Highland, 28 miles south of Butte. It is owned by the First National Bank of Helena and is leased by Lawson & Co. W. D. Flowers is Manager, Superintendent and Foreman. 3 miners are employed underground, 4 topmen and 1 engineer. The main shaft is down 220 feet, the first hundred feet being on an incline of about 65 degrees and the other 120 being vertical. The shaft has been sunk this year. It has two compartments and is timbered with stull pieces. The mode of hoist is a Bucket & McDowell engine,

5 x 7, and a round 5-8 inch rope. There is no work in progress except sinking the shaft.

The Iduna. This mine is owned by Murray and King and is operated under lease by J. H. Maloney & Co. A. F. Driggs is Manager and Superintendent and Patrick Sheehan, Foreman. Employs 6 men underground, 2 topmen and 2 engineers. The shaft is 200 feet deep and has two compartments. It is timbered with 8 x 8 and the mine with square sets and stulls. The ore is copper, silver and gold. A Chandler & Taylor, 8 x 10, engine is used with a round 7-8 inch rope and bucket. Only one exit. Ventilation is good. Shaft house is 40 feet from main shaft. Work on this property was suspended during the latter part of the year.

GRANITE COUNTY.

The Hope. This mine is located at Phillipsburg and is owned and operated by the Hope Mining and Milling Co. N. B. Ringling is Manager and Superintendent, Henry Rehfeldt, Foreman. Employs 25 men underground and 2 topmen. The mine is worked through a tunnel 2500 feet in length. There is also a shaft down 556 feet, 200 feet of which has been sunk this year. It has two compartments. The mine is timbered with square sets and stulls. On the shaft there is a Fraser & Chalmers, 9 x 12, engine with a round 7-8 inch rope. No work is being done through the shaft the mine being operated through the tunnel. The ore is silver. The shaft connects with the tunnel 540 feet north-east from entrance, affording good air to the workings.

The Hobo. This mine is located at Hasmark and is owned by Hines & Lynch. Is operated under lease by McGurk and others. The main tunnel is 420 feet and the other 180 feet. The ore is silver-lead. The mine is timbered with stulls. Ventilation is good. Eight men are employed underground and one on top.

The Nancy Hanks. This mine is located at Garnet. Sam. J. Ritchie and J. S. Auchinvole are the owners. Sam Ritchie is General Manager and Superintendent. Employs 8 men underground, 2 topmen and 2 engineers. The main shaft is down 100 feet, 70 feet of which was sunk this year. It has two compartments. The mine is timbered with stulls. The ore is gold, silver and copper. A 6 x 8 Ledgerwood engine and a

3-4 inch rope are used for hoisting, with a bucket. There are two exits. The main air shaft is about 70 feet south of main working shaft and ventilation is good.

The Shamrock. This mine is located at Garnet and is owned by Michael McDermott and operated under lease by John Patten and others. Peter McDermott is in charge of operations. The main shaft is down 95 feet and has one compartment. It is worked by a windlass. Employs 8 men underground and one topman. The ore is gold, silver and copper. There is but one exit as it is a new property, the shaft having been sunk this year.

The Etna. This mine is located at Royal and is owned and operated by the Royal Gold Mining and Milling Co. J. D. Fletcher is in charge. Employs 33 men underground and 3 topmen. It is worked through five tunnels. No. 1 tunnel is in 2300 feet. No. 2, 1280 feet, No. 3, 1357 feet, No. 4, 1140 feet and No. 5, 350 feet. These tunnels are all connected by upraises making 12 exits. The character of the ore is gold.

BEAVERHEAD COUNTY.

The Atlantic. This mine is located at Hecla, and is owned and operated by the Hecla Consolidated Mining and Smelting Co. Henry Knippenberg is Manager, S. A. Barber, Superintendent and Danl. H. McMaster, Foreman. Employs 60 men underground, 6 topmen and 2 engineers. The mine is worked through a tunnel 3200 feet. There is an inclined shaft at an angle of 30 degrees. It is about 200 feet from the main entrance of tunnel. The shaft is worked by a 7 x 10 Ledgerwood engine. There is a manilla rope 1 1-4 inches thick attached to cars. This incline is down 1000 feet. The mine is timbered with square sets and stulls. The ore is silver, copper and lead. There are 5 exits. The ventilation is good and finger boards are in place.

The Cleve. This mine is located at Hecla and owned and operated by the Hecla Consolidated Mining and Smelting Co. John Hall is Foreman. Employs 30 men underground, 4 topmen and 1 engineer.

The mine is worked through a shaft at an angle of 20 degrees and is down 1425 feet. There is a 6 x 10 Fraser and Chalmers engine, manilla rope 1 1-4 inches and one car. The mine is timbered with square sets and stulls. The character of the ore is copper-silver and lead.

There is no work being done below the 300 foot level. There are two exits. Ventilation is good and finger boards are in place.

The Departure. This mine is located at Bannack and is owned and operated by Lawrence A. Brown, who is also General Manager. Employs 7 men underground and 2 topmen. The mine is worked through three tunnels. No. 1 tunnel is 960 feet, No. 2, 400 feet and No. 3, 510 feet in length. The mine is timbered with square sets and stulls. The character of the ore is silver. There are 6 exits and the ventilation is excellent, as the mine is connected at different points in each tunnel.

The Tilden Group. These mines are owned by Galigher & Clark of Butte and are operated under lease by Ross & McKay. Evan Reese is Foreman. There is a shaft down 75 feet, one compartment, and is worked by a windlass. Eight men are employed.

DEER LODGE COUNTY.

The Emery. This mine is located in the Zosel district and is owned by N. J. Bielenberg and others. It is operated under lease by the Harrington Bros. Phil. Harrington has charge of operations. Employs 50 men underground 8 topmen and 3 engineers. There is an incline shaft (angle 40 degrees) down to a depth of 500 feet, of which 150 feet was sunk this year. The shaft is a single compartment. A Utah & Montana, 8 1-2 x 10 engine and a round 5-8 rope attached to a car, are used for hoisting. The character of the ore is gold, silver and lead. The mine is timbered with stulls. There are 5 exits and ventilation is good.

The Extension. In Zosel district. Is operated by Whalen & Goulden. There is an incline shaft 275 feet at an angle of 35 degrees. No work is in progress below 80 feet from surface. A Buffalo whim is used for hoisting. Four men are employed.

The Hidden Hand. In Zosel district. This mine is operated by John Bielenberg & Co. The shaft is down 60 feet on an angle of 70 degrees. Eight men are employed. John Manley is Foreman.

The Mammoth. This mine is located at Coloma and is owned and operated by the Mammoth Mining Co. A. B. Browne is Manager and Superintendent. Jack Hoatson, Foreman. Employs 14 men underground, 10 topmen and 2 engineers. The main shaft is 285 feet, 125 of which was sunk this year. It has two compartments. The mine is

timbered with square sets and stulls. The ore is gold. A Kendall & Sons engine, 7 1-2 x 12, and a round 7-8 inch rope and one single deck cage are used for hoisting. Safety appliances are tested each week. There are two exits. There is an air shaft 50 feet north of main shaft and connects each level to bottom, and ventilation is good.

The Clementhy. This mine is located at Coloma and is owned and operated by J. W. Moss, who is in charge. Five men are employed underground and 3 on top. The shaft is down 366 feet on an incline of 22 degrees. 132 feet was sunk this year. It has one compartment. The mine is timbered with stulls. The ore is gold and silver. A whim is used. There are four exits and ventilation is good. The air shaft is 35 feet west of main shaft.

Gold Coin Mining Co. The properties of this company are located at Gold Coin. L. M. Loomis is General Manager, C. A. Beaton, Superintendent, and J. P. Judge, Foreman. Employs 28 men underground and 7 topmen. There are two tunnels and a shaft on the properties. No. 1 tunnel, on the Little Josie, is in 125 feet. The Keystone has a tunnel 130 feet. There is a 90 foot incline shaft on the Red Fir. The timbers are square sets and stulls. The character of the ore is gold. A small engine is in use at the Red Fir operated by compressed air, with a 5-8 inch round rope and bucket, used only for hoisting ore. There is a Rand air compressor of 6 drills capacity.

The Clear Grit. This mine, located on Gold Creek, is operated by Clark, Fair, Pruett & Co., and employs 10 men. Operations only began in October, and sinking is in progress at the date of compiling this report.

REPORT OF ACCIDENTS.

OF

EX-STATE MINE INSPECTOR

C. S. SHOEMAKER.

Pony, Montana, November 10th, 1897.

Mr. John Byrne, State Mine Inspector,

Helena, Montana.

Dear Sir:—I herewith submit a report of accidents that occurred in the mines during the time elapsing from the time my last report was issued, until you assumed the duties of the office.

Ex-Deputy Mine Inspector has undoubtedly submitted to you a report of accidents investigated by himself during the same time.

I am, Sir,

Very respectfully yours,

C. S. SHOEMAKER.

Fatal Accidents.

On December 13th, 1897, Alvin Offin met with death in No. 7 stope of the 500 foot level of the Nettie Mine, No. 3, which is owned and operated by the Colorado M. & S. Co. Offin and Fred Young, a fellow miner, had started to pick down some waste from the face of the stope, when they concluded that it would be easier to put in a short hole and blast down the rock. Just as they started to drill about two tons of rock fell knocking Young off the platform and also carying Offin down, crushing him about the hip and spine so seriously as to cause death in about twenty minutes after the accident occurred.

On the 11th of January, John Ingham met with death by a fall of coal in room 35, 2nd South main entry of the Sand Coulee Mines. Ingham and Ben Nelson had mined under 4 1-2 feet of coal, when about 1000 pounds fell on Ingham breaking his leg and injuring him internally. The unfortunate man lived about 6 hours after the accident occurred.

On January 29th, R. G. McLain, a pumpman at the Altona Mine, fell from the crosshead striking on his back, crushing his skull so seriously as to cause death in about two hours after the fall. McLain had been in the habit of jumping off and on the crosshead while in motion. He had been repeatedly warned not to do so by parties working in the mine. He fell a distance of fifteen or twenty feet to the 400 foot level. No blame could attach to the Company.

REPORT OF ACCIDENTS INVESTIGATED BY EX-DEPUTY
JOHN H. MILES FROM DEC. 1st, 1896 TO MARCH 5th, 1897.

FATAL ACCIDENTS.

Joseph Kane. On the 13th of December, 1896, at 3 A. M., Joseph Kane was instantly killed on the 3rd floor of the 800 foot level in the St. Lawrence Mine, Butte. He had been employed in timbering and just previous to the accident was at work making a tenant, close up to the face. John Burns and John H. Cronin were at work one set in the rear of Kane when Cronin noticed some fine dirt rattling down on the plank lagging overhead. He called Burns attention to the fact saying "We had better move back," and suiting the action to the word, both men stepped back one set. Kane must also have heard the dirt moving for he sprang from the position occupied by him and attempted to gain a safe place further back on the floor. Just as he reached the manway about 10 feet from the breast, the upper lagging fell through letting down about 15 carloads of waste and ore. This loose ground knocked down a 5 x 10 brace which, in falling, caught Kane across the shoulder and breast, dropped him to the floor and partially into the manway where he was held fast by the timber. Burns and Cronin were compelled to go to the sill floor and return by the manway before they could reach Kane, as the space between them on the 3rd floor had been closed by the broken lagging. When Kane's body was reached life was extinct. There was a space of 8 or 10 inches between the upper lagging and roof from where the dirt fell and the ground was perfectly dry. No blasting had been done there for two or three days and an examination of the roof showed no signs of a seam. The verdict of the Coroner's jury was "Death from an unforeseen and hence unavoidable accident," and yet had Kane remained in the face where he was he would not have been in the least injured.

James McCann. At one o'clock, A. M., December 27th, 1896, James McCann, a miner working on the 5th floor of the 600 foot level in the Never Sweat Mine, met with an accident so severe in its nature that death resulted three hours after it occurred. McCann and Steve Collins were shovelling ore from the floor close up to the breast when a cave of waste weighing 1200 or 1400 pounds dropped from the hanging wall

and very nearly buried McCann beneath its weight. I examined the ground closely after the accident and found it in most excellent condition. The timbering was well up with the work and the ground had every appearance of being solid and not in the least dangerous. The cave was one impossible to be foreseen and therefor the accident was one of those which are often termed "Unavoidable." I found every precaution for the mens' safety had been exercised.

John Doyle. On the 29th of December, 1896, John Doyle lost his life in the Diamond Mine, Butte, simply through the lack of good judgment, but according to the verdict of the Coroner's jury, "Through his own carelessness and neglect to give the proper signals." Doyle was at work in the bottom of the shaft and had occasion to take some tools to the 700 level, about 27 feet above. He loaded several picks and shovels onto the floor of the cage, got aboard himself and rang the bell for a surface hoist. One of Doyles fellow workmen saw the signal given and warned him not to attempt to stop at the 700 but to continue on up to the surface. When Doyle reached the 700 he attempted to give a stop signal to the engineer but lost his balance and in scrambling about among the tools probably got his feet entangled amongst them and fell in between the cage and wall plates. His body dropped to the bottom of the shaft and Doyle struck on his head and shoulder sustaining injuries from which he died two hours later.

Frank Upton. On the 9th of January, 1897, Frank Upton met with an accident which resulted in death two days later. He was engaged in taking loose rock from the foot wall over the manway in the 5th floor of the 1300 foot level in the High Ore Mine, Butte, when a body of the rock fell, struck the plank lagging upon which Upton was standing, broke the plank and precipitated him into and down the manway leading to the sill floor. The plank was used as a temporary covering to the opening. Upton fell about three sets landing upon his feet at the off-set. Before he could get a hand hold upon the ladder he was overbalanced by the shock and went on down two more floors striking his head and breast on the rocks which covered the floor. Upton was taken to the hospital and from thence to his residence in Centerville where traumatic pneumonia set in causing his death on the 11th instant. The witnesses sworn at the inquest stated that Upton had been in charge of and had timbered the manway from the sill floor up and that he was familiar with the ground which often swelled from the action of lime. He

was considered a good, practical miner, but the management and miners who worked with deceased said Upton should have stood on the timbers at one side of the manway instead of on the plank covering.

John Nolan. On the 21st of January, 1897, John Nolan was almost instantly killed in the main shaft of the Bell Mine. Nolan had been taking girts from the 1300 to the 1500 foot level and at the time of the accident was standing on a platform erected five feet above the station floor. Dan McElroy had boarded the cage and given Smith the signal to hoist. Smith, who was in the Station, saw Nolan on the platform above and on the opposite side of the shaft, but was unaware that he wanted to go up. Smith gave three bells to hoist and when the floor of the cage came up to the platform Nolan attempted to jump on. He was standing in a stooping position and had but four feet space between the platform and roof of the station in which to get action. His body was caught between the cage and wall plate and his life crushed out. Nolan was a good, practical miner and knew better than to attempt to get on the cage when it was in motion.

John Harrington. On the evening of January 28th, 1897, John Conway and John Harrington were working together in the face on the fourth floor of the 1000 foot level in the Mountain Con. Mine. The last blast which went off displaced the lagging over the last set of timbers and had just been replaced by Conway. Harrington took a hammer and attempted to drive the lagging a little closer into place. While so engaged about 200 or 300 lbs of loose talcy ground fell from the face and knocked Harrington over. Some of the lagging was also jarred out of place and fell upon the prostrate man, injuring him internally and bruising the body to a considerable extent. I found upon examination that the timbering was close up and the work being done was to make room for a new set of timbers. The ground was of that nature which gives back no sound of danger when tested with pick or hammer. Harrington was considered one of the best of miners and should have been more cautious.

Tim. W. McCarthy. On the 1st of February, 1897, Tim. McCarthy was killed on the 3rd floor of the 900 level in the Green Mountain Mine. Himself and a miner named S. T. Stafford, had drilled, charged and spitted three holes and each went in a different direction to notify other men of the intended blast. Two of the holes had exploded when McCarthy returned to the place. He did not wait over two minutes after

the first two reports before he went back and had no sooner reached the scene of the two explosions when the third blast took place. He must have been immediately over or very close to the hole as his injuries were such that he died shortly after. Stafford heard the third report and a moment after heard someone groaning. He rushed into the level and found McCarthy lying on his face. There is no known reason why he should have returned so quickly as it is always rutable for miners to wait at least fifteen minutes for the smoke to clear away and oftener much longer for a missed hole.

R. W. Lombard was almost instantly killed at 9 P. M. Feb. 7th, 1897, on the 11th floor, 900 foot level in the Mountain Con. Mine. He had been wheeling waste from the chute and dumping into an opening some 45 or 50 feet away. He left his loaded wheelbarrow where he had filled it and walked over to the place of dumping. He stepped outside a set of timbers and out from under the lagging overhead, when nearly one and one half tons of loose dirt rolled out from the hanging wall and nearly buried him underneath it. Why the man should have gone to that particular place without his barrow is unknown to any of the miners who were working on that floor and will always be clouded in mystery. When the rock was removed from Lombard's neck and body he was unconscious and died in a very few minutes after the accident took place.

Charles Horsfall. On the 23rd of February, 1897, Charles Horsfall, fell into an ore chute on the 5th floor of the 1000 level in the Colusa-Parrot Mine, Butte, and dropped a distance of thirty five feet to the sill floor where he landed on a pile of ore and received such injuries to the spine and other parts of the body that paralysis set in. After going down on the cage at noon with others, Horsfall preceded the other workmen to the 5th floor and was seen at work cleaning up and about the chute, and shoveling the loose ore into the opening. A few minutes later when other men came up they heard someone groaning. Upon investigation, Horsfall was found in the bottom of the chute, badly injured. He was unable to tell how he got there. His shovel was beside him and a candlestick and candle in his right hand. He was entirely alone at the time of the accident, and failed to give an explanation before his death which occurred the morning following. I found the timbering in good shape when I examined the place of accident an hour or two subsequent to its occurrence.

Jerry Shanahan. On the night of March 3rd, 1897, the shift which left the bottom of the shaft in the St. Lawrence Mine, notified the incoming shift, consisting of Jerry Shanahan, Mike Healey, Welsh and Holland, that there was an unexploded hole in the east end and another in the west end of the bottom of the shaft below the 1300 level. Holland and Welsh found a missed hole in the east end, removed the unexploded powder, and began work. Shanahan looked for the missed hole in the west end, but not discovering it immediately, set his drills and began driving new holes. Himself and Healey completed three holes and were down about 3 1-2 feet in the fourth, when the drill slipped into an opening. The men loosened the instrument and started again, remarking that if they had much more trouble they would stop where they were and put in the charge. It was evident to both men that the drill had entered the missed hole left by the shift which preceded them and yet they continued to sink deeper. The drill again entered the opening, struck the stick of powder left there and caused it to explode. Shanahan was almost instantly killed while Healey was badly cut and bruised. Shanahan had been cautioned and knew the powder was there. He had been told by the officials how to proceed under such conditions as existed there; and again he was a first class, practical miner and knew better than to work near an un-exploded hole without first removing the powder. His death was, without the least doubt, the result of his own carelessness.

JOHN H. MILES,

Ex-Deputy Mine Inspector.

